BEFORE

THE PUBLIC SERVICE COMMISSION

OF SOUTH CAROLINA

DOCKET NO. 2019-182-E – ORDER NO. 2021-__

In the Matter of:	)	
	)	
South Carolina Energy Freedom Act (H.3659) Proceeding Initiated Pursuant to S.C. Code Ann. Section 58-40-20(C): Generic Docket to (1) Investigate and Determine the Costs and Benefits of the Current Net Energy Metering Program and (2) Establish a Methodology for Calculating the Value of the Energy Produced by Customer-Generators	)	**PROPOSED ORDER**

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I. INTRODUCTION AND PROCEDURAL HISTORY

This matter comes before the Public Service Commission of South Carolina ("Commission") following the mandate set forth in House Bill 3659, now S.C. Act No. 62 of 2019 ("Act 62"), that the Commission open a generic docket to "(1) investigate and determine the costs and benefits of the current net energy metering program; and (2) establish a methodology for calculating the value of the energy produced by customer-generators." S.C. Code Ann. § 58-40-20(C). On June 10, 2019, the Clerk's Office of the Commission posted notice of an advisory committee meeting to the Commission's Document Management System, notifying the parties that procedural and scheduling issues related to Act 62 would be discussed. Subsequently, comments on the procedural schedule were filed by Vote Solar, Dominion Energy South Carolina, Inc. ("DESC"), and jointly by Duke Energy Carolinas, LLC ("DEC") and Duke Energy Progress, LLC ("DEP") (DEC and DEP are hereinafter the "Companies" or "Duke"). DESC, the Companies, and Southern Environmental Law Center ("SELC") argued that no urgent action in this proceeding was required by the Commission at that time. On August 1, 2019, the Commission issued a Notice of Oral Arguments for August 20, 2019 to discuss procedural issues. On August 19, 2019, DEC, DEP, DESC, Lockhart Power Company, SELC, and the South Carolina Solar Business Alliance ("SBA") submitted a letter informing the Commission that they were in agreement that no immediate action was required by the Commission in this docket and that the parties were working to establish a consensus timeline for initial stakeholder discussions. Oral arguments proceeded on August 20, 2019, at which time SBA orally submitted to the Commission that no action in this docket was required at that time.

On December 2, 2019, Duke filed correspondence notifying the Commission that they were working with Vote Solar to engage other interested parties regarding the procedural schedule in

this docket and regarding logistics of the technical workshops. On December 31, 2019, Duke filed correspondence informing the Commission that they were continuing their work with Vote Solar and were in the process of scheduling further discussions, including with other interested parties, in early January 2020. On March 3, 2020, Duke filed correspondence notifying the Commission that they reached an agreement with the Office of Regulatory Staff ("ORS"), Vote Solar, Sunrun, Inc. ("Sunrun"), SELC, and DESC to hold a series of stakeholder technical workshops. The first workshop was scheduled for March 12, 2020 and the second workshop was scheduled for April 23, 2020. Duke also noted that after the technical workshops, the Companies and stakeholders, and other interested parties planned to begin substantive discussion in pursuit of agreement on the path forward, likely in May 2020.

On July 15, 2020, the Commission issued Order No. 2020-487 requesting comments from the parties on a proposed procedural schedule in this docket. On July 27, 2020, Duke, DESC, ORS, and Vote Solar filed comments regarding the Commission's proposed procedural schedule. On July 29, 2020, the Clerk's Office of the Commission issued a Notice of Filing and Hearing and Prefile Testimony Deadlines (the "Notice"), which set intervention, filing, and hearing deadlines in this generic docket. On August 12, 2020, the Commission issued Order No. 2020-532 wherein it set conflicting dates for intervention, filing, and hearing deadlines. On August 17, 2020, DESC and Duke each filed correspondence with the Commission objecting to the alternative deadlines set by Commission Order No. 2020-532 as arrangements had been made by the utilities to meet the deadlines set forth in the Notice. On August 19, 2020, ORS filed a letter in which it indicated that it had no objection to the procedural schedule submitted by Duke on August 17, 2020.

On August 26, 2020, the Commission issued Order No. 2020-570 in which it set a procedural schedule in the generic docket with dates that aligned with the dates set forth in the Notice. Commission Order No. 2020-570 also set separate proceedings for this generic docket and the dockets in which the solar choice metering tariffs would be considered and approved. On August 27, 2020, the Clerk's Office of the Commission issued a Revised Notice of Filing and Hearing and Prefile Testimony Deadlines (the "Revised Notice"), which indicated the nature of the proceeding and advised all interested parties desiring participation in the scheduled proceeding of the manner and time in which to file appropriate pleadings.

On September 14, 2020, the Clerk's Office of the Commission filed an Affidavit of Publication from The State newspaper in Richland County, South Carolina, which certified that the Revised Notice was published in Richland County on August 30, 2020.

a. Intervention

The North Carolina Sustainable Energy Association ("NCSEA"), represented by Jeffrey W. Kuykendall, Esquire and Peter Ledford, Esquire, filed a Petition to Intervene in this docket on June 23, 2020. Nucor Steel – South Carolina ("Nucor"), represented by Robert R. Smith II, Esquire, filed a Petition to Intervene in this docket on September 17, 2020. The South Carolina Appleseed Legal Justice Center ("Appleseed"), represented by Adam Protheroe, Esquire, filed a Petition to Intervene in this docket on September 16, 2020. Solar Energy Industries Association ("SEIA"), represented by Jeffrey W. Kuykendall, Esquire, filed a Petition to Intervene in this docket on August 26, 2020. South Carolina Coastal Conservation League ("SCCL"), Southern Alliance for Clean Energy ("Southern Alliance"), and Upstate Forever ("UF"), represented by Katherine N. Lee, Esquire, of SELC, filed a Petition to Intervene in this docket on May 4, 2020.

Vote Solar, represented by Thadeus B. Culley, Esquire, filed a petition to intervene in this docket on April 29, 2020. Alder Energy Systems, LLC ("Alder"), represented by Taylor Speer, Esquire, filed an out-of-time Petition to Intervene in this docket on October 11, 2020. There was no opposition to any of the Petitions to Intervene and the Commission issued Orders granting each Petition to Intervene.[1] Lastly, the ORS is considered a party of record in all proceedings before the Commission pursuant to S.C. Code Ann. § 58-4-10, and is represented in this docket by Jeffrey M. Nelson, Esquire, and Jenny R. Pittman, Esquire. DESC was represented by Matthew G. Gissendanner, Esquire, and K. Chad Burgess. Esquire. The Companies were represented by Heather Shirley Smith, Esquire, J. Ashley Cooper, Esquire, and Marion William Middleton, III, Esquire. Collectively, DEC, DEP, DESC, NCSEA, Nucor, Appleseed, SEIA, SCCL, Southern Alliance, UF, Vote Solar, Alder, and ORS are referred to as the "Parties" or individually as a "Party."

b. Testimony

On October 8, 2020, the Parties filed direct testimony.[2] The Companies filed the direct testimony of George V. Brown, General Manager of Strategy, Policy, and Strategic Investment in the Distributed Energy Technology group at Duke Energy Corporation ("Duke Energy"), Lon Huber, Vice President for Rate Design and Strategic Solutions for Duke Energy, Bradley Harris, Rates and Regulatory Strategy Manager for Duke Energy, Dr. Julius A. Wright, Managing Partner

[1] *See* Order No. 2020-367 granting the Petition to Intervene filed on behalf of SACE/CCL/UF; *See* Order No. 2020-366 granting the Petition to Intervene filed on behalf of Vote Solar; *See* Order No. 2020-476 granting the Petition to Intervene filed on behalf of NCSEA; *See* Order No. 2020-597 granting the Petition to Intervene filed on behalf of SEIA; *See* Order No. 2020-655 granting the Petition to Intervene filed on behalf of Nucor; *See* Order No. 2020-654 granting the Petition to Intervene filed on behalf of Appleseed; *See* Order No. 2020-726 granting the Petition to Intervene filed on behalf of Alder Energy.

[2] Alder did not file direct testimony on October 8, 2020, because its Petition to Intervene was filed out-of-time, after October 8, 2020. Rather, Alder filed direct and rebuttal testimony together on October 29, 2020.

of J.A. Wright and Associates, LLC, and Leigh C. Ford, a consultant engaged by Duke Energy to support Duke's regulatory and legal teams in the implementation of Act 62. Exhibits were included with the direct testimony of Witnesses Brown, Huber, Wright, and Ford.

DESC filed the direct testimony of Mark C. Furtick, Manager of Renewable Energy Programs and Technical Services for DESC, Scott Robinson, an independent consultant employed as an Associate Director in the Advanced Solutions group at Guidehouse, and Margot Everett, an independent consultant employed as a Director for Guidehouse. Exhibits were included with the direct testimony of Witnesses Everett and Robinson. ORS filed the direct testimony of Robert A. Lawyer, Deputy Director of Energy Efficiency and Renewables in the Utility Rates and Services Division, Dr. John C. Ruoff, an independent consultant and owner of the Ruoff Group, and Brian Horii, Senior Partner at Energy and Environmental Economics, Inc. ("E3"). Exhibits were included with the direct testimony of Witnesses Horii and Ruoff. Several intervenors jointly filed direct testimony. SCCL, Southern Alliance, UF, Vote Solar, SEIA, and NCSEA filed direct testimony and exhibits of R. Thomas Beach, principal consultant of the consulting firm Crossborder Energy. SCCL, Southern Alliance, UF, and Vote Solar filed direct testimony and exhibits of Frank Hefner, Professor of Economics at the College of Charleston. NCSEA and SEIA filed direct testimony and exhibits of Justin Barnes, Director of Research with EQ Research LLC.

On October 29, 2020, the Parties filed rebuttal testimony. The Companies filed the rebuttal testimony of Witnesses Harris, Huber, and Wright. Exhibits were included with the rebuttal testimony of Witness Harris. DESC filed the rebuttal testimony of Witnesses Everett and Furtick. ORS filed the rebuttal testimony of Witness Horii. Vote Solar filed the rebuttal testimony and exhibit of Odette Mucha, Southeast Regulatory Director. Several intervenors jointly filed rebuttal

testimony. SCCL, Southern Alliance, UF, Vote Solar, SEIA, and NCSEA filed rebuttal testimony of Witness Beach. SEIA and NCSEA filed the rebuttal testimony of Witness Barnes. Lastly, Alder simultaneously filed the direct and rebuttal testimony of Donald R. Zimmerman, President and CEO. Alder filed direct and rebuttal testimony simultaneously given that its out-of-time Petition to Intervene was filed after the deadline for direct testimony in this docket.

The Commission conducted a public evidentiary hearing in this matter on November 17, 2020, November 18, 2020, and November 19, 2020, via videoconference, with the Honorable Justin T. Williams presiding as Chairman on November 17, 2020, and the Honorable Florence Belser presiding as Chair on November 18 and November 19, 2020.[3] On November 17, 2020, DESC Witness Furtick appeared as DESC's first witness. DESC Witness Furtick gave a summary of his direct and rebuttal testimony and answered questions from counsel and the Commission. Witness Furtick provided the Commission with an overview of DESC's current net energy metering ("NEM") programs as well as an overview of DESC's analysis of those programs in this docket. Witness Furtick also cautioned against attempting to quantify things like grid resiliency and economic impacts related to NEM, and testified in support of the Commission utilizing the findings in this docket when evaluating DESC's solar choice tariffs proposed in Docket No. 2020-229-E (the "DESC Solar Choice Docket"). Next, DESC presented Witness Robinson, who provided a summary of his direct testimony and answered questions from counsel and the Commission. Witness Robinson testified in support of DESC's ten-year solar forecast ("DESC Forecast"), which indicates that even in conservative-growth scenarios, distributed solar photovoltaics are expected to increase significantly in DESC's service territory over the next ten

[3] Chairman Williams was on excused military leave for the second and third day of the hearing.

years. DESC then presented Witness Everett, who provided a summary of her direct and rebuttal testimony and answered questions from counsel and the Commission. Witness Everett testified in support of a wide variety of topics, including the value of solar utilized in DESC's existing NEM programs ("DESC'S Existing NEM Programs"), DESC's cost-benefit analysis of those programs, and NEM-related best-practices that have been utilized in other jurisdictions to achieve mitigation of cost-shift and alignment of rates with the cost to serve, among other things. Among Witness Everett's key findings: (i) there is a cost-shift borne by non-NEM customers that arises from the existing NEM programs, (ii) other jurisdictions have utilized mechanisms such as time-of-use ("TOU") rates and minimum bills to mitigate this cost-shift (as contemplated by Act 62), and (iii) the Commission should utilize a broad range of tools when evaluating whether any such best-practices are appropriate for DESC's proposed solar choice tariffs in the DESC Solar Choice Docket.

Then, Duke presented its first witness, Witness Brown. Witness Brown gave a summary of his direct testimony and answered questions from counsel and the Commission. Witness Brown provided the Commission with an overview of the Companies' existing NEM programs ("Duke's Existing NEM Programs" and together with DESC's Existing NEM Programs, the "Existing NEM Programs") and the methodology utilized thereunder, as well as the Companies' ten-year solar forecast ("Duke Forecast"). Witness Brown testified that Duke's Existing NEM Programs are robustly subscribed and that Duke's forecast shows that going forward—whether customers are paid at full retail rate or avoided cost for their exports—Duke expects solar distributed generation to steadily increase across its service territories.

The Commission reconvened the hearing on November 18, 2020, and Duke presented Witness Ford as its next witness. Witness Ford gave a summary of her direct testimony and answered questions from counsel and the Commission. Witness Ford testified in support of the stakeholder process that Duke hosted in connection with this docket. Specifically, Witness Ford testified that the stakeholder process was well-attended and Duke garnered feedback from industry and clean-energy advocates that informed the Companies' analysis in this docket. Next, Duke called Witness Wright, who gave a summary of his direct and rebuttal testimony and answered questions from counsel and the Commission. Witness Wright testified as to the parameters within which the Commission should account for indirect and direct economic benefits when evaluating NEM programs and provided common pitfalls of economic analyses, such as double-counting of benefits. Witness Wright also cautioned that accurately quantifying these benefits present numerous challenges, as evidenced by the fact that no other utility jurisdiction in this country has quantitatively applied such impacts when evaluating NEM tariffs.

Due to scheduling constraints of various witnesses, the Commission permitted the next two witnesses to present testimony out of order. First, SCCL, Southern Alliance, UF, Vote Solar, SEIA, and NCSEA called Witness Beach, who gave a summary of his direct and rebuttal testimony and answered questions from counsel and the Commission. Witness Beach testified in support of utilizing a cost-benefit analysis that balances in the interests of all stakeholders, while also advocating for a default non-zero value for benefits or costs that may be unquantifiable. The second and last out-of-order witness was Witness Barnes, who was called by SEIA and NCSEA. Witness Barnes gave a summary of his direct and rebuttal testimony and answered questions from counsel and the Commission. Witness Barnes testified in support of including broad and

encompassing costs and benefits in any analysis of NEM programs, including economic benefits and grid resiliency, even if all such benefits are difficult to quantify.

From there, the Companies resumed presentation of witnesses and called Witness Harris to the stand. Witness Harris gave a summary of his direct and rebuttal testimony and answered questions from counsel and the Commission. Witness Harris presented the Companies' cost-benefit analysis of Duke's Existing NEM Programs, which reviewed both marginal and embedded costs to find that a certain amount of cost-shift is borne by non-NEM customers under these programs. Witness Harris also provided an examination of how customer-generators impact the Companies' long-run marginal costs—via both self-consumption and exporting power—in a manner similar to qualifying facilities ("QF") under PURPA and customers taking service under energy efficiency ("EE") or demand-side management programs. As its last witness, Duke called Witness Huber. Witness Huber gave a summary of his direct and rebuttal testimony and answered questions from counsel and the Commission. Witness Huber provided testimony regarding the usage profile of NEM customers. Specifically, Witness Huber explained that NEM customers typically experience lower electric bills, but that the bill reduction exceeds the actual reduction experienced by the utility in the cost to serve the NEM customer. This inequity, in part, gives way to the cost-shift presented by Witness Harris, and Witness Huber provided a survey of best-practices that other jurisdictions have used to combat this cost-shift, including TOU rates, demand charges, minimum bills, grid access fees, and non-bypassable charges.

Next, SCCL, Southern Alliance, UF, and Vote Solar called Witness Hefner, who gave a summary of his direct testimony and answered questions from counsel and the Commission. Witness Hefner testified in support of estimated economic benefits arising from NEM programs

in South Carolina. Vote Solar then called Witness Mucha, who provided a summary of her responsive testimony[4] and answered questions from counsel and the Commission. Witness Mucha testified in support of the Commission considering programs and policy options for low-income consumers in the dockets in which the Commission will consider Duke's and DESC's solar choice tariffs.

The Commission reconvened the hearing for the final day on November 19, 2020. First, Alder called Witness Zimmerman. Witness Zimmerman gave a summary of his direct and rebuttal testimony and answered questions from counsel and the Commission. Witness Zimmerman testified in support of NEM policies in South Carolina that favor commercial and industrial ("C&I") customers. Finally, ORS presented its witnesses. First, ORS called Witness Lawyer, who gave a summary of his direct testimony. Witness Lawyer testified in support of the recommendations of ORS in this docket, as detailed by ORS Witness Ruoff and ORS Witness Horii. Next, ORS called Witness Ruoff, who gave a summary of his direct testimony and answered questions from counsel and the Commission. Witness Ruoff testified as to the lack of participation in NEM programs by low-income customers and the benefits that would inure to low-income customers as a result of mitigating the cost-shift arising from NEM programs, in accordance with Act 62. Finally, ORS called Witness Horii. Witness Horii gave a summary of his direct and rebuttal testimony and answered questions from counsel and the Commission. Witness Horii testified in support of ORS's cost-benefit analysis and proposed methodology. Witness Horii advocated for utilizing embedded and marginal costs to examine certain cost of service implications under existing NEM programs, and cautioned the Commission against establishing

[4] Witness Mucha did not provide direct testimony.

new tariffs that overly incentivize distributed energy resources ("DER") at the expense of non-NEM customers. At the conclusion of testimony, the Parties discussed potential deadlines for proposed orders with Hearing Officer Stark. A deadline for proposed orders was set for January 7, 2021. However, Order No. 2020-143-H extended that deadline to January 21, 2021. As such, the Parties filed proposed orders on January 21, 2021.

II. SUMMARY INTRODUCTION TO COMMISSION'S DECISION

This proceeding arises out of the NEM directives in Act 62. Although Act 62 directs the Commission to establish a new NEM program (the "Solar Choice Program")[5] in subsequent dockets, it also directs the Commission to evaluate the cost and benefits of the Existing NEM Programs. This generic docket was established in fulfillment of the latter directive, and the Commission is convinced that the robust record in this proceeding provides a comprehensive view of the Existing NEM Programs in this state and certain NEM-related practices in other jurisdictions.

Although Act 62 provides certain enumerated components which must be included in the Commission's evaluation of the Existing NEM Programs, the Parties submitted testimony with varying opinions on the overall framework within which to evaluate these specific components. Duke advocated for utilizing cost of service studies that account for both embedded and marginal costs in evaluating the statutorily-mandated items within Act 62. DESC advocated for the utilization of four specific tests as the overall framework for the cost-benefit analysis. ORS Witness Horii agreed with Duke's assertion that embedded and marginal costs play an important

[5] While certain testimony was received regarding a Solar Choice settlement entered into by Duke with certain other interested parties, Act 62 makes clear that the Solar Choice dockets are separate from the instant proceeding. As such, any determination or consideration of such settlement agreement is outside the scope of this generic docket and shall only be considered in subsequent Solar Choice dockets.

role in this analysis but noted that marginal costs should be the primary evaluator. Several other Parties set forth yet additional proposed frameworks. Given the disagreement over approaches, the Commission finds the evaluation of embedded costs and marginal costs as the favored framework within which to evaluate the items enumerated within Act 62. This will ensure that the Parties' concerns are accounted for given that it will provide the Commission a comprehensive overview of past investment as well as future expenditures.

The Parties provided a great deal of testimony related to the complexities of serving NEM customers and the corresponding impact to the power grid. At a high-level, NEM is simply a term used to describe a two-way relationship between a customer and a utility. Rather than simply purchasing power from the utility like a traditional customer, NEM customers are also able to sell excess power back to the utility. This power is generated by the customer's on-site generator and the utilities must purchase this power at a pre-determined rate. The current export rate is the full retail rate. In this respect, the NEM customer impacts the power grid in a manner similar to certain QFs under PURPA given that a utility must purchase the electricity supplied by NEM customers and QFs without regard for need. However, unlike the PURPA QF, customer-generators are paid the full retail rate rather than avoided cost. If the customer does not generate excess energy to sell back to the utility, it simply offsets a portion of the power that would otherwise be supplied by the utility. It is undisputed in this proceeding that the ability of the NEM customer to self-consume typically results in lower electric bills given that it no longer requires the utility to supply its full electric load. In this way, NEM customers affect the power grid in a similar manner as EE and demand-side management ("DSM") customers given that these customers similarly reduce the amount of electricity required from the utility. Overall, the record reveals that in this two—way

transaction the utilities do not experience a similar decrease in the cost to serve these customers. In fact, Duke and DESC agree that each utility must necessarily invest in and plan their respective systems for NEM customers just as they do for non-NEM customers.

This aspect of the NEM relationship presents a dichotomy that was a topic of a significant portion of the testimony in this docket. Although it is uncontested that the utilities do not fully recover the costs to serve NEM customers given the lower electric bill, certain Parties dispute the overall effect of this lack of recovery or at least the extent of such impact. Duke and DESC argue that because they cannot adequately recover the cost to serve NEM customers from the same, they must resort to recovering certain costs from non-NEM customers, which results in an unwarranted cost-shift. While ORS agrees that a certain amount of cost-shift exists, other Parties dispute the existence of any cost-shift. However, the Commission agrees with the majority of the Parties in this docket that an unwarranted cost-shift exists under the Existing NEM Programs. A review of the record indicates that this cost-shift has the potential to occur under any NEM program if the rates thereunder do not align with the utility's cost to serve those customers, as is the case with the Existing NEM Programs. This largely arises from the fact that Act 236's primary goal in establishing the Existing NEM Programs was to accelerate the adoption of rooftop solar in South Carolina, and this favorable economic structure within the Existing NEM Programs helped achieve that goal.

However, acknowledging the established presence of rooftop solar in South Carolina, Act 62 calls upon a new generation of NEM that focuses on more accurately aligning rates with cost to serve NEM customers to mitigate the cost-shift currently borne by non-NEM customers in the Existing NEM Programs, rather than just incentivizing further adoption. At the Commission's

request, the Parties provided comprehensive reviews of NEM-related best-practices, which reveal that other jurisdictions have focused their efforts in the NEM context to fully or partially mitigate this unwarranted cost-shift. To do this, jurisdictions have necessarily moved away from simplistic rate structures to more innovative designs. For example, Duke presented evidence that TOU rates are favored in a number of jurisdictions because the rates vary according to the time in which the electricity is used. This means that a customer taking electricity during peak times will pay a higher rate than non-peak times and will pay a lower rate during off-peak times, which corresponds with the utility's cost to serve that customer. Likewise, several of the Parties presented a minimum bill concept as a way to ensure that—no matter the reduction in an NEM customer's electric bill—the utilities will recover a certain fixed amount from those customers per month.

Certain Parties argued that the cost-shift which these mechanisms address could be justified by the direct and indirect economic impacts to the State of South Carolina arising from NEM. The argument being that the positive economic impacts arising from NEM outweigh the cost-shift, such that the Commission should permit the current cost-shift to continue to achieve more economic benefits. The fatal flaw in this argument is that although the Commission is able to at least quantify the parameters of the existing cost-shift, the Commission is unable to quantify the magnitude of the direct and indirect economic impacts of NEM, if any. The record reveals that these economic impacts are extremely difficult to quantify, so much so that apparently no other jurisdiction has quantitatively utilized these impacts in the NEM context. Given the precision required by ratemaking, the Commission declines to be the first to do so at this time. The analyses submitted in this docket simply left too many questions unanswered and included indicators of potential double-counting and overestimation. However, the Commission finds instructive the

economic analysis framework put forth by Duke and finds that any such analysis in the future should comply with the same. Even then, the Commission believes that these impacts are best applied in a qualitative, tie-breaker manner, rather than actually impacting the value of rates of future NEM programs. As for those future NEM programs, the Commission finds that this generic docket may have its greatest impact upon those programs rather than the Existing NEM Programs. As discussed above, the General Assembly outlined a two-step process for NEM in South Carolina. Step one is this generic docket via which the Commission was able to obtain a comprehensive understanding of the nuances of serving NEM customers, rate-making considerations, and trends across the country. Although the Existing NEM Programs remain unchanged for now, the Commission feels confident that the analyses in this docket will certainly impact step two of this process—its consideration of the Solar Choice Programs. Indeed, Act 62 requires the Commission to address items which were topics of voluminous testimony in this docket—including cost-shift and time-variant pricing. Therein lies the true value of this docket, and the Commission, in accordance with Act 62, will leverage the knowledge and information obtained in this docket when considering the Solar Choice Program. Therefore, this Order represents a logical and evidence-based determination of all issues in this docket and follows the intent and direction of the General Assembly in Act 62, which gave rise to this proceeding.

III. JURISDICTION AND GUIDING LEGAL FRAMEWORK

This Commission has jurisdiction over Duke and DESC because they are electrical utilities under the laws of South Carolina and their operations are subject to the jurisdiction of this Commission. The utilities are also subject to Act 62, which requires the Commission to "open a generic docket to: 1) investigate and determine the costs and benefits of the current net energy

metering program; and 2) establish a methodology for calculating the value of the energy produced by customer-generators." S.C. Code Ann. § 58-40-20(D) instructs the Commission to consider the following when evaluating the costs and benefits of the current NEM program:

> (1) the aggregate impact of customer-generators on the electrical utility's long-run marginal costs of generation, distribution, and transmission;
> (2) the cost of service implications of customer-generators on other customers within the same class, including an evaluation of whether customer-generators provide an adequate rate of return to the electrical utility compared to the otherwise applicable rate class when, for analytical purposes only, examined as a separate class within a cost of service study;
> (3) the value of distributed energy resource generation according to the methodology approved by the commission in Commission Order No. 2015-194;
> (4) the direct and indirect economic impact of the net energy metering program to the State; and
> (5) any other information the commission deems relevant.

Consistent with the requirements of S.C. Code Ann. § 58-40-20(C), the Commission initiated this generic proceeding on May 28, 2019. Consistent with the requirements of S.C. Code Ann. § 58-40-20 (C) and (D), the Commission has taken testimony from interested parties related to: 1) the costs and benefits of the current NEM programs, 2) the methodology that should be used for calculating the value of energy produced by customer-generators, 3) the aggregate impact of customer-generators on the utility's long-run marginal costs, 4) the cost of service implications of customer-generators on other customers in the same class, 5) an evaluation of whether customer-generators provide an adequate rate of return to the utility compared to the otherwise applicable rate class when examined as a separate class within a cost of service study, 6) the direct and indirect economic impact of the NEM program to the state, 7) improvements to the procedures and methodology set forth in Commission Order No. 2015-194,[6] 8) best practices from other

[6] *See* Order No. 2020-532.

jurisdictions,[7] 9) a cost benefit analysis from each utility, conducted over ten years,[8] and 10) a forecast of solar distributed generation in each utility's service territories for the next ten years.[9]

IV. OVERVIEW OF EXISTING NEM PROGRAMS

The Existing NEM Programs were established pursuant to Act 236, and arise from a settlement agreement among the Companies, other utilities, ORS, and other industry participants approved by the Commission in Order No. 2015-194 on March 20, 2015 (the "Act 236 Settlement"). Act 236 intended, at least in part, to accelerate the growth of rooftop solar in South Carolina, and the Existing NEM Programs were successful in fulfilling that intent—for example, Existing NEM Programs are robustly subscribed. Under the Existing NEM Programs, customers are charged volumetric rates for the power consumed from the utility and are able to instantaneously consume power generated on-site. As a result, NEM customers typically experience lower electricity bills because these customers consume less power from the utility than typical non-NEM customers. For energy not consumed on-site, customers can export that power to the utilities at the same retail rate that they pay for power consumed from the utility. The current methodology (the "Act 236 Methodology") is part of the Act 236 Settlement and is comprised of 11 factors that represent the estimated power benefits or costs from the production of the solar energy at a customer's premises. Per the Act 236 Settlement, as approved by the Commission, the value calculated thereby (the "Act 236 VOS") is used to determine under- or over-collection of revenue under Existing NEM Programs due to the full retail rate credit for excess power delivered to the utility, and the under-collected amounts are collected by the utilities as an incentive under

[7] *See id*.
[8] *See* Commission Directive issued on August 26, 2020 in Docket No. 2019-182-E.
[9] *See id*.

the Act 236 DER Programs. The Existing NEM Programs are set to expire in 2025 and 2029, and Act 62 requires the Solar Choice Program be established for customers applying for NEM programs after May 31, 2021. However, the Solar Choice Program must reflect certain principles that were not required of the Existing NEM Programs, such as elimination of cost-shift "to the greatest extent practicable" and consideration of "time-variant pricing structures" to align bill savings with the reductions in cost to serve such customers. S.C. Code Ann. § 58-40-20(A)(3); S.C. Code Ann. § 58-40-20(F)(3)(b). As described further below, the findings in this docket will inform the Commission's evaluation of the proposed Solar Choice Programs to ensure that such programs reflect these principles within Act 62.

V. FINDINGS OF FACT

Having heard the testimony of the witnesses and representations of counsel and after careful review of all evidence in the record, the Commission hereby makes the following findings of fact:

a. Cost-Benefit Analysis of Existing NEM Programs

1. Impact on long-run marginal costs.

   i. Although Act 62 does not define marginal costs, a review of the record indicates that these costs reflect the cost of the utility providing an additional unit of some service or product. Necessarily, these costs are forward-looking.

   ii. NEM customers can impact the long-run marginal costs of utilities in two primary ways—via self-consumption or exporting excess energy to the grid.

iii. As for self-consumption, the impact on a utility's operations and costs is the same as if the customer reduced their consumption via an energy efficiency or demand-side management program. Therefore, self-consumption should be valued using the same methodology as energy efficiency or demand-side management programs.

iv. It is reasonable to utilize the methods used to value the marginal benefits of the power exported to the grid by QFs connected to the secondary distribution system when evaluating the marginal impacts of exports on the Companies' long-run marginal costs.

2. Cost of service implications.

i. Examining embedded and marginal costs is a reasonable and appropriate method to quantify cost of service implications in the NEM context.

ii. An analysis of embedded costs is necessary to determine whether the rates under the Existing NEM Programs provide an adequate return to the Companies on investments made in the past to serve such customers.

iii. An analysis of marginal costs is necessary to determine whether the rates under Existing NEM Programs will create a cross-subsidy related to system investments moving forward.

iv. When analyzing embedded costs in a cost of service studies, such studies must utilize existing allocators that have been approved by the Commission in the last general rate case as this is the basis for which current rates are set. The embedded cost analysis in this docket clearly shows that if NEM customers were separated into their own customer class, they would not provide an adequate rate of return because current NEM rates do not recover the true cost to serve these customers. Currently, this shortfall is being recovered from other non-NEM classes.

v. The marginal cost analysis reveals that NEM customers are not adequately compensating the utility for the cost of serving them moving forward, and therefore continue to be cross-subsidized by non-NEM customers.

3. Value of customer generation under the Act 236 methodology. The values utilized in the Existing NEM Programs were last updated and approved by the Commission in Docket Nos. 2020-1-E and 2020-3-E with inputs from the approved values in Docket Nos. 2019-185-E and 2019-186-E. Given the recency within which the Commission last approved these values and the apparent success of the Existing NEM Programs in fulfilling Act 236's goal of accelerating DERs, the Commission sees no reason to modify those values in this docket. However, the Commission notes that these values will continue to be reviewed annually in each utility's fuel proceeding.

4. Direct and indirect economic impacts.

   i. Upon reviewing the record, significant gaps were identified in the analyses purporting to quantify direct and indirect economic impacts, and the Commission is unable to assess such impacts with sufficient precision to determine the economic impacts of the Existing NEM Programs to the State of South Carolina.

   ii. To the extent the Commission decides to utilize such impacts in future evaluation of NEM programs, those impacts should only be utilized in a qualitative nature given the inability to precisely and reliably quantify these impacts.

b. Methodology for calculating the value of energy produced by customer-generators.

5. Given the success of the Existing NEM Programs in fulfilling Act 236's intent to jump start solar adoption in South Carolina with favorable economics for NEM customers, the Commission declines to change the Act 236 Methodology at this time, and orders that it shall continue to be utilized in Existing NEM Programs. However, the Commission notes that such an approach may not be appropriate under a different statutory framework, such as Act 62's Solar Choice Program.[10]

c. Ten-year solar forecast.

6. Although the forecasts presented in this docket are predicated on a variety of unknowns, it appears that, in almost all scenarios, South Carolina is likely to see an

[10] The Commission notes that the solar choice program under Act 62 contains different NEM-related mandates, such as eliminating cost-shift. The Commission will consider whether such methodology is appropriate to carry forward in the pending solar choice dockets.

increase in solar adoption over the next ten years, reflecting a demand in the market that exists outside of any specific tariff structure.

d. NEM best practices.

7. It is clear from the Commission's examination of the record that jurisdictions across the country are increasingly utilizing innovative rate structures, often in combination, that are different than the basic rate structures utilized in Existing NEM Programs.

8. Eliminating this cost-shift to the "greatest extent practicable" when developing the Solar Choice Program is a specific mandate within Act 62. As such, the Commission will evaluate a broad range of innovative rate structures, including the structures presented in this docket, to ensure that the Companies are able to more accurately recover the cost to serve NEM customers while permitting Solar Choice customer-generators to use customer-generated energy behind the meter without penalty.

VI. EVIDENCE AND CONCLUSIONS

a. Cost-Benefit Analysis of Existing NEM Programs

EVIDENCE AND CONCLUSIONS SUPPORTING FINDINGS OF FACT 1(I) – 1(IV)

The evidence in support of these findings of fact is found in the verified pleadings, testimony, and exhibits in this docket, and the entire record in this proceeding.

Act 62 requires an analysis of customer-generators on the Companies' "long-run marginal costs of generation, distribution, and transmission." S.C. Code Ann. § 58-40-20(D)(1).

Summary of the Evidence

Act 62 requires this analysis to account for the "marginal costs" associated with the generation, distribution, and transmission costs associated with utility operations. Although Act 62 does not define "marginal costs," Duke Witness Harris testified that these marginal costs can be viewed as the costs of the utility to provide an extra unit or a product or a service—an extra unit of generation, for example. (Tr. Vol. 2, p. 353.13.) This analysis necessarily involves an examination of costs that have yet to be incurred, as opposed to embedded costs, which are historical costs that have already been incurred. (*See id*.) Mr. Harris goes on to explain that customer-generators impact the long-run marginal costs of utilities in two primary ways: via self-consumption behind the meter and excess energy exported to the grid. (Tr. Vol. 2, p. 353.13-353.14.) As for self-consumption behind the meter, Mr. Harris notes that from a utility's perspective, the effects on the utility's long-run marginal costs is no different than a customer that participates in an energy efficiency or demand-side management program. (*Id*.) In both scenarios, the utility simply sees a reduction in that customer's consumption of power from the utility. (*Id.*) As for energy generated by customer-generators, that is exported to the utility, and the utility must pay avoided cost for that energy. (*Id.*) As such, Mr. Harris argues that the effect on the utility's long-run marginal costs is similar to a utility's purchase obligations under PURPA, and such energy should be valued at the same avoided cost[11] paid to QFs under PURPA that are connected to the utility's secondary distribution system. (*Id.*)

[11] Mr. Harris notes that the Companies' most-recent avoided cost numbers were approved by the Commission in Docket Nos. 2019-185-E and 2019-186-E.

DESC Witness Everett utilized four commonly accepted cost-benefit tests in analyzing the costs and benefits of DESC's Existing NEM Programs over a 20-year horizon—Total Resource Cost Test (the "TRC"), the Utility Cost Test (the "UCT"), the Participant Cost Test (the "PCT"), and the Rate Impact Measure Test (the "RIM"). (Tr. Vol. 1, p. 125.23.) The inputs for each of these tests were derived from either the currently-effective values for the Act 236 Methodology or DESC Forecast provided by DESC Witness Robinson in this docket. (Tr. Vol. 1, p. 125.26-125.27.) The outputs for each of these tests measure the net benefits of an investment and also provides a ratio of absolute value of benefits to absolute value of costs. (Tr. Vol. 1, p. 125.20-125.21.) Witness Everett explained that if the latter ratio is close to 1, costs and benefits are nearly equal, with a number greater than 1 representing costs that are much lower than benefits, and vice versa. (*Id.*) Although Witness Everett utilized each one of these tests, she cautioned that each test is designed to "look at cost[s] and benefits from different perspectives." (Tr. Vol. 1, p. 147.) Most germane to this prong of Act 62's cost-benefit analysis is the UCT, which gives "feedback on the costs and benefits related to the utility" in connection with DESC's Existing NEM Programs. (*Id.*) Specifically, the UCT measures the "net costs of a demand-side management program as a resource option based on the costs incurred by the program administrator . . . excluding any net costs incurred by the participant." (Tr. Vol. 1, p. 125.23.) In measuring the impacts on DESC's long-run marginal costs, Witness Everett's UCT revealed that the net benefits to DESC is effectively zero because DESC is "made whole through current cost recovery mechanisms" for the cost impacts associated with these customer-generators, whether in the form of a cost-shift to non-NEM customers or recovery through the Fuel Clause. (Tr. Vol. 1, p. 125.34.)

Witness Beach, testifying on behalf of SCCL, UF, Southern Alliance, Vote Solar, SEIA, and NCSEA, did not quantify the long-run impacts of NEM on either Duke's or DESC's long-run marginal costs, but instead proposed a general framework within which such impacts should be evaluated. (Tr. Vol. 2, p. 290.11) Witness Beach advocates for a broad, expansive framework that considers not only costs associated with "environmental compliance at marginal fossil-fueled power plants," but also benefits associated with future technologies, such as "enhanced reliability and resiliency." (Tr. Vol. 2, p. 290.14) Likewise, Witness Beach argues that the best-practices for designing such cost-benefit analyses should emphasize consistency with "similar analyses which have become standard practice for all demand-side resources." (Tr. Vol. 2, p. 290.11) As such, Witness Beach argues that the Act 236 NEM Methodology is an adequate methodology to capture customer-generator's impact on long-run marginal costs, but goes on to argue that where such input values are not quantifiable, that those non-quantifiable values should automatically be assigned a non-zero value. (Tr. Vol. 2, p. 290.20) Witness Beach proposes to use the National Economic Research Associates ("NERA") regression method to determine certain long-run marginal costs, which estimates the marginal cost of transmission and distribution investments associated with changes in peak demand. (Tr. Vol. 2, p. 294.13)

ORS Witness Horii, in agreement with Duke Witness Harris's classification, described these long-run marginal costs as an incremental change in the future, such as the "cost of changing the output of the most expensive to operate plant that is producing power." (Tr. Vol. 3, p. 576.9) Citing Act 62's "long-run" qualifier, Witness Horii opined that such qualifier indicates Act 62's intent to not only reflect variable costs in this analysis, but also fixed costs, such as generation, transmission, and distribution assets. (*Id.*) For example, in Mr. Horii's opinion, if load changes

required the construction of new transmission and distribution ("T&D") facilities, then the long-run marginal costs would include long-run T&D as well. (*Id*.) Mr. Horii also stipulated that any measure of marginal costs should (i) be based on future costs, (ii) reflect future conditions, particularly given that each additional MW of solar is worth less to the system, and (iii) not be unduly discriminatory against specific technologies. (Tr. Vol. 3, p. 576.21)

On rebuttal, Witness Harris noted Duke's agreement with Witness Beach that existing frameworks should be used when measuring the long-run impacts on Duke's long-run marginal costs under Duke's Existing NEM Programs. (Tr. Vol. 2, p. 355.11) Specifically, Mr. Harris noted that the approach for which Mr. Beach advocated is echoed by Duke's utilization of existing EE/DSM frameworks to value self-consumption and avoided costs under Schedule Purchased Power to value excess energy exported to Duke. (*Id*.) In support of Mr. Harris's testimony, Duke Witness Huber noted that in viewing exports in terms of avoided cost and self-consumption through an EE/DSM lens, the Companies would be able to value each of those aspects through existing, Commission-approved mechanisms—specifically, the Companies' Schedule Purchase Power for valuing exports and the Commission approved EE/DSM framework for self-consumption. (Tr. Vol. 2, p. 404)

Witness Everett noted that although the UCT test was the primary test utilized to determine the impact of customer-generators on long-run marginal costs, the treatment of costs and benefits within the UCT depend heavily on the specific aspects of any such program or tariff. (Tr. Vol. 1, p. 131.5) For example, in the context of the Solar Choice Tariffs, Act 62 prohibits the recovery of lost revenue, but such a requirement was not present within Act 236. (Tr. Vol. 1, p. 131.7) Therefore, the treatment of the lost revenues within the UCT, and thus the impact on DESC's long-

run marginal costs, may need to be modified in the context of DESC's Solar Choice Docket. (*Id*.) As such, the UCT should not be overly prescriptive in analyzing impacts on long-run marginal costs, but should be evaluated in the context of a specific tariff or program. (*Id*.)

Witness Beach's rebuttal testimony contained similar analyses of the RIM, UCT, PCT, and TRC that were contained in Witness Everett's testimony, but also included a Societal Benefits Test ("SBT") which Witness Everett did not include. (Tr. Vol. 2, p. 294.21) Utilizing a combination of these tests, Witness Beach concludes in his rebuttal testimony that, in the long-run, DESC can expect deployment of rooftop solar on its system to reduce the utility's cost to serve. (Tr. Vol. 2, p. 294.25)

Finally, Witness Horii provided rebuttal testimony alleging that Witness Everett incorrectly included bill savings in the UCT by mischaracterizing these savings as "customer incentives." (Tr. Vol. 3, p. 578.5) Witness Horii notes that excluding these bill savings is consistent with industry practice and would more accurately reflect utility costs given that bill savings are not truly incentives, rather, they are "transfer payments between utility customers and do not affect total utility costs." (*Id*.)

Commission Determination

The Commission has fully reviewed the extensive testimony provided in this proceeding, including the varying assessments the impacts of customer-generators provided by the Utilities. Initially, in accordance with Act 62, the Commission finds that an analysis of long-run marginal costs is appropriate to determine the impacts of customer-generators on the utilities' costs of generation, distribution, and transmission." (§ 58-40-20(D)(1)) The Commission is cognizant of the fact that not only have the various intervenors presented different perspectives on this item,

but so too have the utilities. At the outset, the Commission finds it necessary to define the term "marginal costs" in the context of this specific section of Act 62 given that the Act provides no such definition. A review of the record indicates that the Parties are in agreement that the term is a common term that indicates costs that have yet to be incurred. Specifically, marginal costs represent the future costs of providing the next increment of the variable being measured—in this case, long-run transmission, generation, and distribution.

The Commission has heard testimony on multiple occasions in prior dockets how the specific aspects of each utility's system that may vary from the other. Likewise, in this docket, the utilities have presented evidence that the adoption levels of customer-generation on each system varies. However, testimony submitted by various parties indicates that the primary nuances of serving NEM customers is consistent across both utilities—self-consumption and exports. Given that each utility provided testimony, as discussed further below, regarding similar complexities arising from these aspects of serving NEM customers, the Commission finds it reasonable and appropriate to evaluate customer-generators impacts on utilities' long-run marginal costs through these lenses.

As for self-consumption, it is uncontested in this record that an NEM customer's ability to self-consume decreases the amount of power—at least over an entire billing period—that the customer requires from the utility. This necessarily results in a decreased load-profile from a utility's perspective, and a lower electricity bill from the customer's perspective. The record reveals that these effects are similar from the utility's perspective to the effects of customers utilizing EE or DSM mechanisms. That is, under both scenarios, the primary effect on utility operations is that the customers—at least over an entire billing period—require less energy to be

delivered from the Utility.[12] The Parties have presented no persuasive arguments to the contrary. Therefore, the Commission agrees with the approach for which Duke Witness Harris advocated—certain of these costs should be valued via the mechanisms approved by the Commission for EE and DSM programs.

As for exports, the utility must purchase excess energy exported by these customer-generators without regard for system need or geographical location of such customer-generator. Indeed, under the definition of "customer-generator" in Act 62, NEM customers qualify as QFs under PURPA, which means that utilities have a "must-take" obligation and are required to purchase the power put to them. The rates at which utilities pay non-NEM QFs is set at an avoided cost rate. These rates are set annually in proceedings before the Commission, which entail robust testimony and litigation over the values and components of such avoided cost rates. However, these rates are separate from the values and components that the utilities currently pay for power exported by NEM customers, for which customers are credited at retail rate. To be clear, the Commission is not tasked with altering that Act 236 VOS in this docket or otherwise modifying the Act 236 Methodology. However, the Commission sees no material difference—at least in this limited aspect—between the customer-generator's production that is deemed to be exported based upon the metering measurement approved by the Commission (per 58-40-20(F)(2)) or non-NEM QFs exporting power to utilities given that they are both transferred under a must-take obligation, whether under PURPA or an applicable NEM tariff. Similarly, the Parties have presented no persuasive evidence regarding any material differences. Although the Commission acknowledges

[12] The Commission notes that although the effect is similar, the reductions related to EE/DSM programs primarily occur during peak times, inuring a benefit to the overall system. The reductions related to NEM customers cannot guarantee the same benefit given that they are not constrained to peak periods.

that the Act 236 Methodology was established with the goal of accelerating adoption of rooftop solar in South Carolina, going forward, the Commission is under no such mandate in establishing the Solar Choice Programs under Act 62. Likewise, reliance on existing, Commission-approved mechanisms aids administrative economy given that the Commission will not have to develop new frameworks and can rely on these comprehensive analytical frameworks that were litigated before the Commission. Additionally, the Commission notes that it is not forever bound by such determinations and may re-visit this finding in similar proceedings.

The Commission finds unpersuasive the arguments made by Witness Horii and Witness Beach that forecasting the impacts upon a utility's marginal costs should include a broad spectrum of factors such as future technologies and resiliency benefits that are difficult to predict or quantify. The task of forecasting marginal costs—regardless of whether these additional costs and benefits are included—is already a complex process. Including these additional, complex factors—if even warranted at all—in any such analysis would only further and unnecessarily complicate that process. In this aspect, the Commission finds another benefit in simply utilizing the methods and analyses that have already been litigated before, and approved by, the Commission within the avoided cost and EE/DSM framework. These dockets are also regularly brought before the Commission for further review and approval. As discussed above, although the Commission is not tasked with modifying Existing NEM Programs in this docket, the Commission finds it as a reasonable and appropriate option in future NEM programs to view an NEM customer's impact on a utility's long-run marginal costs through the lens of (i) EE/DSM programs for self-consumption and (ii) PURPA avoided costs for deemed exports.

EVIDENCE AND CONCLUSIONS SUPPORTING FINDINGS OF FACT 2(I) – 2(IV)

The evidence in support of these findings of fact is found in the verified pleadings, testimony, and exhibits in this docket, and the entire record in this proceeding.

Act 62 requires an examination of:

> [T]he cost of service implications of customer-generators on other customers within the same class, including an evaluation of whether customer-generators provide an adequate rate of return to the electrical utility compared to the otherwise applicable rate class when, for analytical purposes only, examined as a separate rate class within a cost of service study.

On this point, the Commission heard robust testimony regarding two primary cost of service implications that typically arise under NEM programs—cost-shift and subsidization. Specifically, to what extent this cost-shift or subsidization occurs under Existing NEM Programs and whether marginal costs, embedded costs, or both types of costs are the appropriate tool by which to judge the cost-shift or subsidization.

Summary of the Evidence

Initially, Duke Witness Huber provided the Commission with background as to why cost of service implications arising to non-NEM customers is or particular concern in the NEM context. (Tr. Vol. 2, p. 385.6-385.7) Mr. Huber explained that the crux of the concern lies within the usage profile of a typical NEM customer. (*Id*.) As described above, NEM customers are able to instantaneously consume power generated on-site, which means that a typical NEM customer will experience a lower electric bill due to its decreased reliance upon the utility to provide power. However, Mr. Huber noted that the utility's costs to serve such customers do not similarly decline given that the distribution system must be "designed, constructed, and operated to provide safe and reliable service to all customers." (Tr. Vol. 2, p. 385.7) For example, although there may be

times when NEM customer-generators are able to offset their full requirements of electricity from the utility via self-consumption, there will also be peak times during which the customer-generator is unable to self-consume any power, such as during a thunderstorm. (*Id*.) During those times, the utility must be able to supply that customer's full load requirements. (*Id*.) Where a utility seeks to recover this shortfall from other, non-NEM customers, a cost-shift or subsidization arises, which is expressly cautioned against within Act 62. (§ 58-40-20(A)(3))

To examine these cost of service implications under Duke's Existing NEM Programs, Duke Witness Harris provided an embedded cost of service study (the "Duke Embedded Cost Study"). (Tr. Vol. 2, p. 353.5) As explained above, an examination of embedded costs is an examination of historical costs that have already been incurred by a utility. (Tr. Vol. 2, p. 353.13) Mr. Harris explained that an examination of embedded costs in this scenario is appropriate to determine whether customer-generators pay their fair share of costs that have been incurred to serve such customer. (*Id*.) Where the customer-generator's electric bill is less than the cost to serve such customer, an "unwarranted cost-shift" is borne by non-NEM customers. (Tr. Vol. 2, p. 353.5) Witness Harris presented the results of the Duke Embedded Cost Study, which revealed that adding solar generation "fundamentally decouples the relationship between energy usage and demand" such that the NEM customer's bills under Duke's Existing NEM Programs do not accurately reflect the cost to serve those customers. (Tr. Vol. 2, p. 353.11) The result, according to the Duke Embedded Cost Study, is that non-NEM customers experience an un-warranted cost-shift. (Tr. Vol. 2, p. 353.12) He goes on to explain that this is the fundamental reason that these NEM customers would not provide an adequate rate of return as a separate rate class because there would

be no way to recover the existing cost-shift from non-NEM customers, leaving the Companies with a shortfall in recouping the cost to serve these NEM customers. (*Id*.)

As for DESC, Witness Furtick echoed the testimony of Duke Witnesses Huber and Harris in describing a typical NEM customer. (Tr. Vol. 1, p. 19.6) Witness Furtick noted that not only does DESC have to remain ready and able to serve the full load requirements of NEM customers, just as with non-NEM customers, but the load profile of NEM customers is simply more dramatic given the addition of solar. (*Id*.) By way of example, Mr. Furtick points to a day when mid-day thunderstorms move quickly over an NEM customer's residence. (*Id*.) In that case, a customer may rapidly change from self-reliant, to consuming its entire load requirements from DESC, then back to self-reliant. (Tr. Vol. 1, p. 19.7) Mr. Furtick argues that not only does DESC have to be prepared to serve NEM customer's full load requirements, but also must be ready and able to track the variability in the customer's solar generation given that load requirements necessarily exhibit a corresponding variability. (Tr. Vol. 1, p. 19.9)

DESC Witness Everett examined this aspect of DESC's Existing NEM Programs via the RIM test, which Ms. Everett notes it a "good indicator of potential cost shifts within and among customer sectors." (Tr. Vol. 1, p. 125.35) Specifically, Ms. Everett states that the RIM test measures what happens to customer bills or rates due to changes in utility revenues and operating costs caused by NEM programs. (Tr. Vol. 1, p. 19.12) Witness Everett's RIM test revealed that DESC's avoided costs under DESC's Existing NEM Programs are "far less" than NEM customer's bill savings, which indicates that a cost-shift arises under DESC's Existing NEM Programs that is borne by non-NEM customers, just as with Duke's Existing NEM Programs. (Tr. Vol. 1, p. 125.34)

However, Witness Beach outlined several alleged flaws in the utilization of a RIM test to determine certain cost of service implications under NEM programs. (Tr. Vol. 2, p. 290.17-290.18) One such alleged flaw outlined by Mr. Beach is that, even though the RIM test may be appropriate to analyze cost-shift occurring in the past given that it accounts for historical costs, any assessment of future NEM programs and related cost-shifts should not utilize the RIM test for this same reason. (Tr. Vol. 2, p. 290.18-290.19)

ORS Witness Horii provided a report E3 created prior to the initiation of this docket that revealed a cost-shift arising under Duke's Existing NEM Programs. (Tr. Vol. 3, p. 576.13) However, Mr. Horii cautioned that such estimate may not be accurate for Duke's Solar Choice Tariffs. (Tr. Vol. 3, p. 576.17) While acknowledging this cost-shift, Witness Horii noted that on a broader level, cost-shift is not relegated to the NEM realm, but can arise for "any resource or customer decision that results in the customer having a usage pattern that differs from the usage pattern used to design the customer's rate." (Tr. Vol. 3, p. 576.20) Mr. Horii noted that this cost-shift can be quantified using either a marginal cost analysis or an embedded cost analysis. (Tr. Vol. 3, p. 576.15) Under a marginal cost analysis, the bill savings minus the utility's marginal cost savings amount to the cost shift. (Tr. Vol. 3, p. 576.15-576.16) Under an embedded cost analysis, the cost shift equals the difference between costs allocated to NEM customers compared to what those customers would pay on an otherwise applicable rate. (Tr. Vol. 3, p. 576.16) Although Mr. Horii prefers to utilize a marginal cost analysis because it utilizes the customer's bill immediately prior to the installation of solar as a starting point—as opposed to modeling NEM customers as a separate class in an embedded cost study—Witness Horii notes that both tests are "valid and important" when evaluating Duke's and DESC's Solar Choice Tariffs that have been proposed to

this Commission in separate dockets. (Tr. Vol. 3, p. 576.15) However, Witness Horii took issue with the Summer Coincident Peak demand metric utilized by Duke in their embedded cost to serve studies, and noted that Duke "is facing more winter peaking supply constraints." (Tr. Vol. 3, p. 576.19) As such, Mr. Horii argues that the winter peak demand allocator is a more appropriate demand metric to utilize in the embedded cost to serve studies, which would likely result "in only a small reduction in demand-related costs allocated to solar customers which would increase the . . . cost shift attributed to the solar customers." (*Id.*)

ORS Witness Ruoff highlighted the practicalities of the existing cost-shift by detailing the typical demographics of NEM customers. (Tr. Vol. 3, p. 550.3-550.4) Although Dr. Ruoff did not provide state-specific data, he presented national-level data that indicated NEM customers are typically higher-income households. (*Id.*) As such, Witness Ruoff testified that a cost-shift borne by non-NEM customers typically means that at least some portion of low-income customers are subsidizing higher-income NEM households. (Tr. Vol. 3, p. 555) Dr. Ruoff provided testimony indicating that mitigating cost-shift will not only achieve the principles of Act 62, but would also reduce the energy burden on low-income, non-NEM households. (Tr. Vol. 3, p. 550.12)

On rebuttal, Witness Harris noted agreement with ORS Witness Horii that embedded and marginal cost studies provide a useful lens through which to evaluate cost-shift. (Tr. Vol. 2, p. 355.7) However, Witness Harris cautioned that the studies should be used in conjunction to satisfy Act 62. (Tr. Vol. 2, p. 355.8) For example, an analysis of marginal costs will determine whether customers will pay their fair share of costs going forward, while an embedded cost analysis will evaluate whether customers are currently paying their fair of historical costs that have already been incurred to serve those customers. (*Id.*) In support of this testimony, Witness Harris provided

Duke's marginal cost study which indicated—just as the embedded cost study—that a cost-shift arises under Duke's Existing NEM Programs. (Tr. Vol. 2, p. 353.3-353.4)

In support of Witness Harris's testimony, Duke Witness Huber provided rebuttal noting that this unwarranted cost-shift arises from the fact that rates under Duke's Existing NEM Programs "are elementary and not sufficiently aligned with the Companies' cost to serve NEM customers." (Tr. Vol. 2, p. 387.3) Witness Huber echoed the testimony of Witness Harris in noting that this Commission should not be constrained to either marginal or embedded costs in evaluating Duke's upcoming Solar Choice Tariffs, and should instead utilize both. (Tr. Vol. 2, p. 387.7) Witness Huber also defended Duke's use of the Summer Coincident Peak demand metric in its embedded cost to serve studies given that it "is consistent with the Companies' most recently Commission approved Cost of Service Studies." (Tr. Vol. 2, p. 387.6) Witness Huber noted that the embedded cost of service studies performed in this docket utilize the same methodology and demand metrics "that [were] supported by the ORS and approved by the Commission." (*Id*.) Witness Huber explains that the Companies cannot utilize a different allocator until such time as it "is fully considered in a separate rate proceeding before the Commission." (Tr. Vol. 2, p. 387.6-387.7) In response to Dr. Ruoff, Witness Huber agreed that positive impacts will inure to lower-income customers if the cost-shift arising under Existing NEM Programs were mitigated in accordance with Act 62, but Mr. Huber suggested that those matters should be considered in the specific Solar Choice Tariff dockets rather than in this generic proceeding. (Tr. Vol. 2, p. 387.8-387.9)

Witness Beach provided rebuttal testimony in response to DESC Witness Everett's testimony, and noted that the RIM test actually shows that no cost-shift exists under DESC's

Existing NEM Programs. (Tr. Vol. 2, p. 294.25) However, Witness Beach acknowledged that in evaluating new tariffs, such as the Solar Choice Tariffs, the UCT is a more appropriate test given that it will be forward-looking rather than a review of an existing program. (Tr. Vol. 2, p. 294.28)

ORS Witness Horii took issue with Witness Beach's characterization of the RIM test in Mr. Beach's direct testimony. (Tr. Vol. 3, p. 578.10) Mr. Horii stated that the RIM test correctly separates NEM from non-NEM customers, which is appropriate when evaluating the cost of service implications required by Act 62. (Tr. Vol. 3, p. 578.9) Mr. Horii goes on to note that although Act 62 forbids penalizing customer-generators for consuming energy behind the meter, there is no similar mandate that such consumption should be excluded from cost of service considerations. (*Id*.) Mr. Horii also notes that the RIM is appropriate to measure cost-shift going forward because the cost-shift itself is a "forward-looking incremental cost for non-participants." (Tr. Vol. 3, p. 578.10)

Finally, Witness Mucha responded to Dr. Ruoff's testimony regarding low-income customers. (Tr. Vol. 3, p. 445.3) While acknowledging that such issues are of critical importance, Witness Mucha, in agreement with Duke Witness Huber, cautioned that those issues would be more appropriately considered in the upcoming Solar Choice Tariff dockets. (*Id*.)

Commission Determination

The Commission has reviewed the evidence presented on this issue, including the studies presented by each utility regarding the cost to serve NEM customers. A review of the record indicates that there are certain cost of service complexities in serving NEM customers that are simply not present when serving non-NEM customers. These complexities arise from one of the defining characteristics of NEM programs discussed above—self-consumption. For example, it is

uncontested that NEM customers under Existing NEM Programs typically experience a lower bill over applicable billing periods because they are able to offset the electricity they require from the utility via self-consumption. This necessarily means that the utility serving those NEM customers does not recover as much revenue as when serving non-NEM customers given that the simplistic rate structure under the Existing NEM Programs simply bills customers for volumetric usage rather than accounting for demand. However, the utility does not experience a similar decrease in the cost to serve these customers. As Duke Witness Huber and DESC Witness Furtick outlined, there certainly can be times when NEM customers are able to offset their consumption during peak times. However, there can also be times—during a mid-day summer thunderstorm, for example—where an NEM customer's rooftop solar is generating no power. This means that the utility must plan and invest to serve an NEM customer's full peak-load requirements just like a non-NEM customer. Essentially, the volumetric rates paid by NEM customers are not reflective of the cost to serve those customers, resulting in an insufficient cost recovery from NEM customers under the Existing NEM Programs. Under the Existing NEM Programs, the remainder of the costs to serve those NEM customers is recovered from non-NEM customers, resulting in a cost-shift.

However, the way in which the Commission should quantify this cost-shift is in dispute. The dispute centers upon whether the analysis should account for embedded costs, marginal costs, or both. Although there is some disagreement as to which measure is most appropriate, there is general agreement as to the definition of each measure. The Parties generally agree that embedded costs, for example, are costs that have already been incurred. In the NEM context, these costs represent the past investment to serve current customers (things like building generation plants, for example). It is also apparent that the Parties agree that the Act 62 requires the Commission to

utilize an embedded cost analysis when evaluating NEM programs. Likewise, the Parties generally agree that marginal costs represent future costs that the utility will incur as a result of producing one more unit of service—serving an additional kWh during a peak time, for example. The Commission finds these definitions reasonable and appropriate. Essentially, analyzing embedded costs will determine whether customers are paying their share of costs that have already been incurred, while analyzing marginal costs will determine whether those same customers will pay their share of costs going forward. Given that customers in Existing NEM Programs will benefit not only from prior investments made by the utility, but also investments going forward (including reliability upgrades and grid modernization), the Commission finds it reasonable and appropriate to examine both embedded and marginal costs to determine cost of service implications under NEM programs in South Carolina. Analyzing only embedded costs or marginal costs does not capture the reality of serving these customers. Viewed through these lenses, it is clear that an unwarranted cost-shift arises under Existing NEM Programs because the bill savings realized by NEM customers—for both DESC and Duke—are greater than the corresponding reduction in the utilities' cost to serve those customers. On this point, the Commission notes that ORS and Duke agreed that such a cost-shift exists and that analyzing marginal and embedded costs can provide valuable feedback. However, Duke and ORS disagreed as to whether the Summer CP should be used in Duke's analysis of embedded costs. Duke argues that utilizing the Summer CP is appropriate given that it is a Commission-approved allocator on which current rates are based, while ORS argues that using a winter metric would more accurately reflect future system conditions. The Commission finds it reasonable and appropriate to utilize Commission-approved allocators from the most recent rate cases when examining embedded costs given that those

historical costs were allocated pursuant thereto and this allocator is used for rates currently in effect. As for the magnitude of the cost-shift, similar estimates of the cost-shift have been provided. However, the Commission is not tasked with adopting a precise value of such un-warranted cost-shift and declines to do so at this time.

Given the existence of this cost-shift, the Commission finds that NEM customers would not provide the utilities with an adequate rate of return as a separate rate class under Existing NEM Programs given that the utilities would simply have no other avenue within that class to recover costs currently associated with the cost-shift. As for those current non-NEM customers that are impacted by the current unwarranted cost-shift, the Commission notes that a review of the record indicates that low- and medium-income customers make up a larger proportion of non-NEM customers than they do NEM customers. This means that any un-warranted cost-shift results in at least some low- and medium-income customers subsidizing NEM programs for NEM customers with higher incomes. As such, the Commission finds that in evaluating the utilities' proposed Solar Choice Tariffs, eliminating unwarranted cost-shift "to the greatest extent practicable" in accordance with the directive within Act 62 will positively impact non-NEM low- and medium-income customers that do not have access or the means necessary to install rooftop solar. As discussed below, the Parties in this docket have presented various best-practices which the Commission may evaluate in order to eliminate this unwarranted cost-shift in the context of the Solar Choice Tariffs.

EVIDENCE AND CONCLUSIONS SUPPORTING FINDINGS OF FACT 3

The evidence in support of these findings of fact is found in the verified pleadings, testimony, and exhibits in this docket, and the entire record in this proceeding.

Act 62 requires the cost-benefit analysis to consider "the value of energy resource generation" according to the Act 236 Methodology.

Summary of the Evidence

Duke Witness Brown provided direct testimony indicating the success of Duke's Existing NEM Programs in achieving Act 236's goal of accelerating the growth of rooftop solar in South Carolina. (Tr. Vol. 1, p. 165.7) Specifically, the Companies have exceeded their minimum goals for the programs under Act 236 with a combined capacity of rooftop solar in excess of 100 MW. (*Id*.) Given the success under Duke's Existing NEM Programs, the Companies do not propose a change in the Act 236 VOS at this time. (Tr. Vol. 1, p. 165.12)

DESC Witness Everett presented the values that DESC inputs into the 11 components of the Act 236 Methodology. (Tr. Vol. 1, p. 125.14) These DESC values were updated in the company's most-recent avoided cost proceeding via Order No. 2020-244. (Tr. Vol. 1, p. 125.13) As such, Ms. Everett utilized these values when performing her cost benefit analyses of DESC's Existing NEM Programs, but determined the 10-year levelized value for each year of the 20-year analysis. (Tr. Vol. 1, p. 125.27)

ORS Witness Horii expressed concerns regarding the methods by which DESC calculates certain of the current values within the Act 236 Methodology. As for Duke, Witness Horii does not propose any changes to the values calculated by the Companies but notes that Duke's Solar Choice Docket should allow for investigation of the validity of the current values. (Tr. Vol. 3, p. 576.31)

On rebuttal, Witness Everett affirmed her use of the currently-approved values as inputs for the Act 236 Methodology. (Tr. Vol. 1, p. 131.9) However, Witness Beach expressed concerns

with Witness Everett's analysis, suggesting it does not represent the full spectrum of costs and benefits arising from such resources. (Tr. Vol. 2, p. 294.5)

Lastly, Alder Witness Zimmerman noted that although five components of the Act 236 Methodology have maintained zero values since 2015, "Alder's customers will [not] accept the utilities' position that the Commission should maintain zero dollar values" for any components of the Act 236 Methodology. (Tr. Vol. 3, p. 494.6-494.7) Although Mr. Zimmerman did not provide any proposed values for any components, he stated that the Commission can promote "investment confidence" by allocating non-zero values to all components of the Act 236 Methodology. (Tr. Vol. 3, p. 494.7)

Commission Determination

A review of the record indicates that both DESC's and Duke's NEM programs have been successful in fulfilling Act 236's goal of jump-starting the adoption of rooftop solar in South Carolina given that both DESC's and Duke's NEM programs are fully-subscribed. The record indicates that at least part of that success is due to the favorable economics inuring to NEM customers under Existing NEM Programs via the simplistic rate structure thereunder and the Act 236 VOS. As discussed throughout this order, the simplistic rate structure under Existing NEM Programs results in an unwarranted cost-shift because these rates are unable to fully and accurately capture the cost to serve NEM customers. Although such a cost-shift is allowed as an incentive for NEM under Act 236, this means that non-NEM customers are left to shoulder certain costs that would otherwise be paid by these NEM customers. As for the Act 236 VOS, it arises from the Act 236 Methodology that was approved by the Commission under the NEM Settlement. The currently-effective values that are input to the methodology were approved by the Commission in

Docket Nos. 2020-1-E and 2020-3-E. Although there have been specific values proposed for certain components of the NEM Methodology in this docket, the Commission does not interpret Act 62 as requiring the Commission to adopt new values in this docket. Rather, Act 62 simply requires the Commission to evaluate what role such values play in the Existing NEM Programs under the umbrella of the overall cost-benefit analysis required by Act 62. That finding is clear—the current values have been successful in fulfilling Act 236's goal of accelerating the adoption of rooftop solar in South Carolina. However, the Commission cautions that the findings herein related to these values and the underlying Act 236 Methodology are confined to the NEM programs created under Act 236 and the statutory guideposts set therein. The Commission's consideration of the utilities' proposed Solar Choice Tariffs will be bound by different mandates—specifically, those related to cost-shift and aligning rates with cost of service under Act 62.

Although the Commission declines to adopt new values at this time, several Parties have suggested that the Commission establish certain presumptions when setting these values going forward. Chief among these suggestions is that certain of the components of the Act 236 Methodology should be assumed to have non-zero values, regardless of whether those values can be adequately quantified. For example, Alder expressed concern that its C&I customers would simply not accept any values of the Act 236 Methodology to remain at zero. The Commission finds these arguments unpersuasive. A presumption that components of the methodology should start at "non-zero" unless quantified otherwise simply decouples the valuation of these components from the necessarily quantitative and analytical pillars of the ratemaking process. The valuation of these components should remain rooted in robust analytics rather than qualitative assumptions. As for Alder's assertion that its customers simply would not accept any of the values in the

methodology remaining at zero, the Commission cites the well-established success of the Existing NEM Programs and, specifically, a record indicating that C&I NEM customers will continue to expand—an assertion not disputed by Alder.

EVIDENCE AND CONCLUSIONS SUPPORTING FINDINGS OF FACT 4(I) – 4(II)

The evidence in support of these findings of fact is found in the verified pleadings, testimony, and exhibits in this docket, and the entire record in this proceeding.

Act 62 requires the cost-benefit analysis of Existing NEM Programs to consider the "direct and indirect economic impact" of Existing NEM Programs to the State of South Carolina. The bulk of the testimony submitted in this docket related to this topic focused upon whether the Commission can sufficiently quantify, if at all, these impacts in the manner required by a rate-making proceeding.

Summary of the Evidence

Although Duke Witness Wright did not conduct an actual analysis of direct and economic impacts of NEM in South Carolina, he did provide the Commission with parameters within which any such impacts, if any, must be considered and a brief overview of how such impacts have been utilized in other jurisdictions. (Tr. Vol. 2, p. 260.4) Initially, Dr. Wright opined that it would be highly unusual for such impacts to play a quantitative role when evaluating NEM programs—so unusual that Dr. Wright is unable to provide any evidence of utility commissions that have considered economic impacts in such a quantitative fashion—meaning that no such jurisdictions have assigned a dollar value to such impacts that was added or subtracted from the overall costs used in such state's NEM program. (Tr. Vol. 2, p. 260.7) Indeed, Dr. Wright presented evidence that other states in the Southeast—Georgia and North Carolina—have specifically rejected the

consideration of economic impacts in the NEM context. (Tr. Vol. 2, p. 260.19) Apparently, the reluctance to utilize such impacts in a quantitative manner is reflective of the difficulty in actually quantifying and defining those impacts with enough precision to translate to the necessarily quantitative rate-making process. (*Id*.) For example, Act 62 gives no definition for "direct and indirect economic impacts," but Dr. Wright proposes to define them in his direct testimony. (Tr. Vol. 2, p. 260.9) Dr. Wright notes that it is reasonable to think of direct impacts as the "changes in economic activity for the particular part of the economy. . . that first experiences change." (*Id*.) On the other hand, indirect impacts "typically represent the increase in economic output from the various industries whose output is impacted by the industry affected with the direct economic impact." (*Id*.) Dr. Wright also alludes to a third type of economic impact that is outside the scope of Act 62—induced impacts. (*Id*.) In addition to being outside the scope of Act 62, Dr. Wright notes that attempting to assess these impacts typically leads to skewed, inaccurate results. (Tr. Vol. 2, p. 260.10) Even with the difficulties in quantifying such impacts, Dr. Wright notes that it is common to utilize an input-output model (such as IMPLAN or JEDI) to assess such impacts. (*Id*.) However, Dr. Wright cautions that the results are only as good as the model, and there are important considerations when developing the model and corresponding analysis. (Tr. Vol. 2, p. 260.11) Chief among these concerns, according to Dr. Wright, are:

- Properly characterizing the purpose of the economic study and reporting the results with appropriate recognition of this purpose.
- Considering the economic consequences if a policy is not adopted, referred to as the "but for" option.
- Ensuring an "apples to apples" comparison.
- Properly considering incentives and subsidies.
- Considering electric rate impacts.
- Properly accounting for the timing of the economic stimulus and related impacts.
- Appropriately characterizing the presumed economic impacts.

- Utilizing an appropriate geographic region.
- Recognizing sound economic principles in the overall results.

(*Id*.)

Dr. Wright warned that not following even one of these guiding tenets could lead to double-counting of impacts, ignorance of opportunity costs, or inaccurate attribution of economic benefits, among other things. (Tr. Vol. 2, p. 260.11-260.17) As such, Dr. Wright recommends that, at best, such impacts should only be applied from a qualitative perspective so long as the underlying analyses are sound and reflect the principles recited above. (Tr. Vol. 2, p. 260.7)

DESC Witness Everett similarly did not provide an economic analysis, but instead explained that because Act 62 does not define direct or indirect economic impacts, that it can be reasonably inferred that the Act intended to measure impacts in terms of "conventional economic growth metrics such as an increase in South Carolina's Gross Domestic Product ('GDP') and increases in job levels within South Carolina." (Tr. Vol. 1, p. 125.7) Through this lens, Witness Everett explained that direct impacts "would be measurably responsible for creating GDP growth or jobs while [i]ndirect would be the secondary" impacts of those metrics. (*Id*.) However defined, Witness Everett echoes Dr. Wright's sentiment that these impacts are "extremely difficult to specifically measure and thus must be inferred through economic forecasting methodologies." (*Id*.) A fundamental aspect of these methodologies, Witness Everett argues, is that they must necessarily include a base case to compare against, but given the inherent difficulty in quantifying these impacts in the first place, there is no way to obtain an accurate "Base Case." (*Id*.) Witness Everett concedes that even if a base case could be obtained, there is no clear way to determine whether such impacts arise specifically from NEM or from the broader group of renewables in South

Carolina, such as utility-scale solar. (Tr. Vol. 1, p. 125.8) Ms. Everett cautions that although much of the testimony submitted focuses on potential positive economic impacts, there can also be negative economic impacts arising from NEM, such as cost-shifts borne by non-NEM customers. (*Id*.) As a result, and in-line with Duke Witness Wright, Ms. Everett advocates against inclusion of such benefits when evaluating an NEM program. (*Id*.)

Witness Hefner, testifying on behalf of SCCL, Southern Alliance, Upstate Forever, and Vote Solar, presented two economic impact studies to the Commission—one focused upon the impact of the overall solar industry (NEM, utility-scale, etc.) in South Carolina and one delineating such impacts into market sectors. (Tr. Vol. 2, p. 417.4) Dr. Hefner's studies accounted for the direct and indirect impacts contemplated by Act 62, but also induced impacts. (Tr. Vol. 2, p. 417.5) Dr. Hefner defined direct economic impacts as the "purchase of local services, labor, and goods," while indirect impacts are the purchases of goods and services by "the firms in South Carolina that install solar panels." (*Id*.) Dr. Hefner explains that induced impacts should be considered as the impact of purchases as a result of wages paid. (*Id*.) Although Dr. Hefner's studies are specific to South Carolina, Dr. Hefner explains that the underlying data is not given that it was extrapolated from numbers and percentages at the national level. (*Id*.) Dr. Hefner's results indicate an almost $3,000,000,000 impact to the state of South Carolina arising from the solar industry over the course of 2018 and 2019. (Tr. Vol. 2, p. 417.6) Dr. Hefner's asserts that approximately half, or $1,500,000,000, of those impacts arise directly from the residential rooftop sector. (*Id*.) Dr. Hefner likens this impact to the "combined direct impact of the GE Power turbine plant in Greenville and the NUCOR Steel plant in Berkeley County." (Tr. Vol. 2, p. 417.7)

Witness Barnes provides a brief overview of economic impact studies that have been performed in other states, while echoing Duke Witness Wright's testimony that most jurisdictions simply consider economic impacts in a "qualitative" manner. (Tr. Vol. 2, p. 327.6) However, Witness Barnes cites two studies that attempted to quantify these economic impacts on a $/MWh basis and cited these studies as evidence that economic benefits could be used in the NEM context to justify cost-shift. (*Id*.) Witness Barnes goes on to concede that although these studies attempt to quantify these impacts, "regulators have generally exercised caution when viewing the results" of these studies. (Tr. Vol. 2, p. 327.18) Witness Barnes opines that these economic benefits are perhaps best utilized in a qualitative fashion in the context of ratemaking given the difficulty in quantifying such impacts. (Tr. Vol. 2, p. 327.36) Witness Barnes provided the Commission with examples from Arizona and Nevada that allegedly linked changes in NEM rate structures with job losses in those states, while echoing Witness Everett's concerns "it is not possible" to trace all of these job losses back to DER policy changes. (*Id*.) Witness Beach testifies in support of the economic analysis of Dr. Hefner and Mr. Barnes in advocating for not only the inclusion of induced economic benefits but also societal benefits under the umbrella of Act 62's "direct and indirect" characterization. (Tr. Vol. 2, p. 287)

Witness Horii, in highlighting the difficulty in defining the terms "direct and indirect economic impacts" within Act 62, notes that indirect economic impacts "is an extremely broad term that could apply to a myriad of situations." (Tr. Vol. 3, p. 576.10) However, Witness Horii attempts to define these terms, with direct impacts meaning those that would impact bills or utility shareholder earnings. (*Id*.) Mr. Horii explains that indirect economic impacts should be defined as impacts "that may accrue to the South Carolina economy in general and South Carolina utility

customers in particular due to DER." (*Id.*) Echoing Dr. Wright's testimony, Witness Horii cautioned that the extent to which impacts should be utilized in assessing NEM programs depends upon the "amount of rigor and the availability of the data." (Tr. Vol. 3, p. 576.32) Citing studies utilized in other states, Witness Horii notes that "the value of indirect economic benefits varies significantly across studies." (Tr. Vol. 3, p. 576.34) In citing the wide range of possible values, Mr. Horii stresses "the need for diligence and transparency in the development of any indirect economic impact values to be used in South Carolina." (Tr. Vol. 3, p. 576.35)

On rebuttal, Duke Witness Wright notes several areas of agreement with Witness Horii, included the fact that both parties believe that indirect economic impacts should not "be included in the primary valuation of NEM." (Tr. Vol. 2, p. 262.5) Likewise, Dr. Wright expressed agreement with Witness Horii in that this information should largely be utilized on a qualitative basis. However, Dr. Wright notes that he disagrees with Witness Horii to the extent Mr. Horii's testimony implies that assessing any economic impact is a straightforward exercise given the complexities and nuances involved in quantifying these impacts. (Tr. Vol. 2, p. 262.6) Dr. Wright also expresses concern for the tenor of Witness Beach's testimony, which Dr. Wright argues seems to imply that uneconomic policies or an increased cost-shift in the NEM context may be justified to "subsidize the DER market in South Carolina." (Tr. Vol. 2, p. 262.8) Dr. Wright argues that before any such decision is made, "such a claim would need to be affirmatively demonstrated . . . and any resulting harm should be quantified." (*Id.*) Dr. Wright goes on to explain that Witness Barnes' proposed "broad and forward-looking" approach simply compounds the inherent difficulties in quantifying economic impacts in the first place. (Tr. Vol. 2, p. 262.9) Dr. Wright notes that asking the Commission to speculate about "potential future" benefits is simply too

speculative for even a qualitative analysis. (*Id*.) Lastly, Dr. Wright responds to the economic analyses presented by Witness Hefner. (Tr. Vol. 2, p. 262.10) Dr. Wright alleges that the analyses performed by Witness Hefner are concerning in several ways, including the absence of state-specific data, the omission of a "but-for" analysis, the failure to account for "net economic impacts," a lack of accounting for incentives, a potential for double-counting, and a bold assumption that solar energy is apparently "a direct substitute for fossil-based electric generation." (Tr. Vol. 2, p. 260.10-262.11) As a result, Dr. Wright argues that Dr. Hefner's analyses "at best, overstate any economic benefit and at worst actually understate potential economic harm." (Tr. Vol. 2, p. 262.5)

In response to the direct testimony provided by intervenors related to economic impacts, DESC Witness Everett noted that she believes economic impacts can be considered in a cost-benefit analysis of future NEM programs, so long as (i) the impacts are measurable and symmetric, (ii) causality is clearly linked, and (iii) an understanding of impacts to low- and medium-income customers should be considered. (Tr. Vol. 1, p. 131.12) Witness Everett goes on to echo certain of Dr. Wright's concerns related to Dr. Hefner's analyses, including insufficient safeguards to ensure that certain jobs and benefits were not double-counted. (*Id*.)

Witness Barnes takes exception to Ms. Everett's statement that economic impacts should only be considered in future proceedings so long as certain parameters are met. (Tr. Vol. 2, p. 331.5) Rather, Witness Barnes alleges that Act 62 requires such impacts to be included in the examination of the Existing NEM Programs. (*Id*.) Witness Barnes notes that although Ms. Everett is concerned with the uncertainty presented by evaluating economic impacts, all components are subject to uncertainty and none should be assumed more reliable than others. (Tr. Vol. 2, p. 331.7)

Witness Barnes goes on to describe that it is "relatively easy" to establish a base case for an economic analysis, as well as to trace such benefits directly back to NEM rather than other renewable resources, such as utility-scale. (*Id*.)

Commission Determination

On this topic, the Parties presented the Commission with a broad spectrum of testimony, ranging from estimates of economic impacts in South Carolina, to best-practices regarding how such impacts should be analyzed in this context. At the outset, the Commission notes that economic impacts are not currently utilized in South Carolina to either evaluate NEM programs or otherwise set rates for the same. As discussed further below, it appears that South Carolina is not an outlier given that testimony indicates that no other jurisdiction considers economic impacts in a quantitative manner in the NEM context. However, Act 62 calls upon the Commission to determine whether "direct and indirect" economic impacts arise as costs or benefits under the Existing NEM Programs. As is the case with other items examined in this docket, Act 62 does not define "direct and indirect" economic impacts. Regardless, the Parties generally agree that these terms imply different levels of resonance of economic impacts. For example, direct economic impacts can be considered as closest to the epicenter of the activity. These direct impacts are the immediate economic changes resulting from the activity at issue. In the NEM context, these direct impacts may manifest themselves in the initial investment in, and installation of, a rooftop solar system. Indirect economic impacts may be viewed as one step removed from these immediate impacts. Indirect economic impacts in the NEM context may be the change in supply of goods to rooftop solar installers as a result of such initial installation and purchase. Although the call of Act 62 specifically enumerates "direct and indirect" economic impacts, certain Parties have urged the

Commission to consider "induced" economic impacts that could result from a ripple effect of the combined direct and indirect impacts. Given the express language within Act 62, the Commission declines to opine on these induced economic impacts.

As for the direct and indirect economic impacts of NEM in South Carolina, the Parties vary widely in their assessment of such impacts. For example, Duke and DESC caution that these impacts are so difficult to quantify in any precise manner that the Commission should be wary of any such estimates unless analyzed under a strict analytical structure akin to that under which the Commission sets electric rates and avoided costs. However, other Parties in this docket claim that such impacts can be quantified with enough precision to be quantitatively applied to an evaluation of an NEM program.

Indeed, the multiple positions advanced by the Parties, including Witness Hefner's ambitious estimates, illustrate a fundamental point—direct and indirect economic impacts are difficult to ascertain, which leads to a broad spectrum of viewpoints on the same topic. Although the Commission declines to adopt a specific estimate of economic impacts at this time, the Commission finds value in the testimony presented which proposes a framework for the consideration of any such impacts in the future. When establishing things like avoided costs in ratemaking proceedings, the Commission typically evaluates a robust record with precise analytical frameworks and verified underlying data. Given that the direct and indirect economic impact of NEM in South Carolina could affect the rates thereunder, the Commission sees no convincing reason to view these impacts through a different lens. That is, for the Commission to consider any such impacts in future NEM proceedings, the Commission must be persuaded that the estimates have utilized verified data under a precise analytical framework. As for the

parameters of such framework, the Commission finds persuasive the analytical framework set forth by Duke's expert, Dr. Wright. Specifically, Dr. Wright argued that for the Commission to consider direct and economic impacts at all, the Commission must ensure that the analytical framework accounts for key concerns, including:

- Properly characterizing the purpose of the economic study and reporting the results with appropriate recognition of this purpose.
- Considering the economic consequences if a policy is not adopted, referred to as the "but for" option.
- Ensuring an "apples to apples" comparison.
- Properly considering incentives and subsidies.
- Considering electric rate impacts.
- Properly accounting for the timing of the economic stimulus and related impacts.
- Appropriately characterizing the presumed economic impacts.
- Utilizing an appropriate geographic region.
- Recognizing sound economic principles in the overall results.

(Tr. Vol. 2, p. 260.11)

The Commission finds this framework as a reasonable and appropriate starting point for considering—if at all—the direct and indirect economic impacts of NEM in South Carolina in future NEM-related proceedings. However, even when analyzed under this framework, the margin for error is so thin that the results may be wildly skewed even if one component of the analysis is flawed. Indeed, quantifying these impacts with precision is so rife with pitfalls that no other jurisdiction has considered them quantitively in the NEM context, and even though Witness Barnes cites two studies that attempted to do so, he conceded that "regulators have generally exercised caution when viewing" quantitative economic impacts and suggested perhaps they should only be utilized in a qualitative manner. As if to highlight these concerns, the Commission finds that Mr. Hefner's study merely extrapolates a national study to estimate impacts in South Carolina, without

utilizing sufficiently creditable and verifiable inputs. Therefore, the Commission finds it reasonable and appropriate to adopt a two-step approach to analyzing economic impacts in the NEM-context in South Carolina. First, the analysis must be designed in accordance with the parameters set forth by Dr. Wright, above. Second, those results should only be applied in a qualitative, "tie-breaker" manner, rather than actually assigning a dollar value to such impacts which translates to rates. The Commission finds that this two-pronged framework will adequately protect ratepayers in South Carolina from any potential adverse rate impacts arising from a miscalculation of economic impacts.

b. Act 236 Methodology

EVIDENCE AND CONCLUSIONS SUPPORTING FINDINGS OF FACT 5

The evidence in support of these findings of fact is found in the verified pleadings, testimony, and exhibits in this docket, and the entire record in this proceeding.

Act 62 requires the Commission to establish a methodology for "calculating the value of the energy produced by customer-generators." As outlined above, the Act 236 Methodology was established pursuant to the NEM Settlement and is comprised of 11 separate components. Although the value of the inputs to the Act 236 Methodology have been updated since the execution of the NEM Settlement, the 11 components have remained the same. The Act 236 computes the Act 236 VOS, which is the value paid to customer-generators for exporting excess energy to the applicable utility.

Summary of the Evidence

Duke Witness Brown provided an overview of Duke's Existing NEM Programs, and noted their apparent success in fulfilling the Act-236 specific mission to accelerate the growth of rooftop

solar in South Carolina. (Tr. Vol. 1, p. 165.7) Specifically, Duke's Existing NEM Programs have surpassed the minimum goals set by Act 236, with DEC and DEP combining for over 100 MW of rooftop solar in their service territories. (*Id.*) Given the success in fulfilling Act 236's mandate to "jump start" rooftop solar in South Carolina, Mr. Brown noted that the Companies are not seeking to modify this methodology for Duke's Existing NEM Programs. (Tr. Vol. 1, p. 165.12)

Similarly, DESC Witness Furtick testified to the success of DESC's Existing NEM Programs in establishing rooftop solar in South Carolina, as evidenced by the almost 11,000 NEM customers enrolled in those programs. (Tr. Vol. 1, p. 19.4) According to Mr. Furtick, this presence of rooftop solar contributes to DESC being among the leaders in the Southeast with regard to the amount of solar on its system. (Tr. Vol. 1, p. 19.5) However, Mr. Furtick cautions that the primary goals of Act 62 do not align with the growth-centric goals of Act 236 when it comes to rooftop solar, and a different alignment of costs and benefits may be necessary going forward. (*Id*.) Given the success in fulfilling Act 236's mission to establish rooftop, Witness Furtick stated that DESC does not seek a change in the components of the Act 236 Methodology, but simply a change in the way two components of the Act 236 Methodology are calculated. (Tr. Vol. 1, p. 19.13) DESC Witness Everett testified that the two changes relate to the calculation of the Avoided Energy Component and the Line Losses Component. (Tr. Vol. 1, p. 125.15) As for Avoided Energy Costs, Witness Everett proposes that the calculation of that component "be further segmented to represent the variation in Avoided Energy Costs by season and time of day." (*Id*.) Witness Everett argues that this adjustment would better reflect the variability of customer-generation given that it "is not constant across the year and across a day." (*Id.*) As for the Avoided Line Losses Component, Witness Everett recommends distinguishing transmission losses from distribution losses and

creating a "value for Transmission losses that applies to all customer-generation and a Distribution Losses Component that applies to only the customer-generation simultaneously consumed on-site." (Tr. Vol. 1, p. 125.16) DESC Witness Everett argues that this adjustment would properly reflect the fact that although every kWh consumed on-site avoids T&D losses, the energy exported to the system does not necessarily "reduce the losses of energy delivered to other customer meters." (Tr. Vol. 1, p. 125.17) Lastly, Witness Everett cautions against including what she characterizes as "externality costs" within the Act 236 Methodology. (Tr. Vol. 1, p. 125.19) These can include things like direct and indirect economic impacts, and Ms. Everett argues they are simply "very difficult to quantify" and create complications when introduced to the quantitative rate-making process. (Tr. Vol. 1, p. 125.18)

Witness Beach generally agrees that the Act 236 Methodology represents a "comprehensive value stack" for valuing excess energy exported to the grid by customer-generators. (Tr. Vol. 2, p. 290.14) However, Witness Beach states that the Act 236 Methodology does not adequately account for potential new benefits offered in the future by advancements in DER technology. (*Id.*) Specifically, Witness Beach argues that increased adoption of solar + storage in the NEM context in the future may provide certain resiliency and reliability benefits that should be reflected in the Act 236 Methodology. (*Id.*) Witness Beach cites the potential for such customer-sited solar + storage may provide certain benefits to broader ratepayers during power outages. (Tr. Vol. 2, p. 290.26)

Witness Horii, in-line with the Duke and DESC witnesses, ultimately concludes that "the list of avoided cost components in [the Act 236 Methodology] is appropriate." (Tr. Vol. 3, p.

576.42) Likewise, Alder Witness Zimmerman acknowledged that he does not "dispute or oppose the Commission's use of the [Act 236] Methodology in this proceeding." (Tr. Vol. 3, p. 494.6)

Commission Determination

A review of the record indicates that the Parties are more aligned on this topic than perhaps any other component of the analyses required in this docket. As discussed above, the Act 236 Methodology has been successful in establishing rooftop solar in South Carolina in fulfillment of Act 236's mandate. Neither of the utilities suggest a change in the components of the Act 236 Methodology. Likewise, ORS characterizes the methodology as "appropriate" and Alder Energy does not "dispute or oppose the Commission's use" of the Act 236 Methodology. Although Witness Beach agrees that the methodology is "comprehensive," he challenges the Commission to consider including certain components that reflect potential future benefits to the utilities, such as solar + storage. The Commission has been presented with no persuasive evidence that these potential future benefits should be included in a currently-effective methodology. Given the general agreement among the Parties, the success in fulfilling Act 236's goals, and lack of persuasive evidence that the current value stack should be modified, the Commission declines to make any changes to the Act 236 Methodology under the Existing NEM Programs.

c. Ten-Year Solar Forecast

EVIDENCE AND CONCLUSIONS SUPPORTING FINDINGS OF FACT 6

The evidence in support of these findings of fact is found in the verified pleadings, testimony, and exhibits in this docket, and the entire record in this proceeding.

Pursuant to Act 62, the Commission may consider "any other information the [C]omission deems relevant" in this generic docket. Pursuant thereto, and via Commission Directive issued on

August 26, 2020, the Commission required "utilities to provide a forecast of solar distributed generation in their service territories for the next 10 years."

Summary of the Evidence

Duke Witness Brown provided the Duke Forecast. (Tr. Vol. 1, p. 165.13) Witness Brown explained any such adoption forecast is dependent upon a variety of factors, including, but not limited to, costs of installation of solar generation, financing costs, and availability of tax incentives. (Tr. Vol. 1, p. 165.13-165.14) However, Witness Brown noted that the Companies' provided two scenarios in the Duke Forecast that centered upon the only factor that is subject to Commission control—the credit provided to the NEM customer for its solar production. (Tr. Vol. 1, p. 165.14) As such, the Duke Forecast contains two different rate scenarios: (i) full retail rate credit for all solar production and (ii) avoided costs paid for all solar production in accordance with the Commission approved 10-year Standard Offer avoided cost rate. (*Id*.) Although the Duke Forecast indicated continued, steady growth of rooftop solar in South Carolina, Witness Brown noted that the full retail rate scenario obviously project a higher adoption rates given that the production credit in that scenario would provide increased compensation to customer-generators when compared to the avoided-cost scenario. (Tr. Vol. 1, p. 165.16)

DESC Witness Robinson provided the "DESC Forecast. (Tr. Vol. 1, p. 93.7) Similarly to the Duke Forecast, the DESC Forecast presented by Mr. Robinson contained several forecasts based upon alternative scenarios. (Tr. Vol. 1, p. 93.8) Witness Robinson explained that the DESC Forecast provided projections under three scenarios: (i) Low-Cost, (ii) Mid-Cost, and (iii) High-Cost. (Tr. Vol. 1, p. 93.8) Witness Robinson acknowledged that a multitude of factors can influence the rate of solar adoption in South Carolina, but the DESC Forecast seeks to account for

several of those key factors. (*Id*.) For example, the assumptions range from the Low-Cost scenario—which assumes deflated installation prices and extension of the ITC—to the High-Cost scenario, which envisions inflated installation prices and the expiration of the ITC. (*Id*.) Witness Robinson explained that conservative estimates were used for certain factors across all scenarios, with such factors including, but not limited to, customer loan interest, escalation of rates on par with inflation, and a static capacity factor based on 2020 values. (Tr. Vol. 1, p. 93.9) Nonetheless, Witness Robinson forecasted overall growth across all sectors and all scenarios over the next ten years, although Witness Robinson noted that adoption rates across single family and C&I customers has already begun to slow in recent years. (Tr. Vol. 1, p. 104)

There was little rebuttal testimony provided on the issue of the ten-year forecasts, but Alder Witness Zimmerman voiced displeasure over several aspects of the Duke Forecast and the DESC Forecast. (Tr. Vol. 3, p. 494.9-494.10) As for the Duke Forecast, Witness Zimmerman took issue with the modeled system size of 8kW—which he claims is not reflective of C&I customers—as well as the alleged lack of information regarding the payback period. (Tr. Vol. 3, p. 494.9) As for the DESC Forecast, Witness Zimmerman argued that the forecast should have pre-supposed that the 1:1 bill credit will be ending within the forecast period. (Tr. Vol. 3, p. 494.6) Additionally, Witness Zimmerman argued that the DESC Forecast failed to adequately account for entities that do not pay income tax. (Tr. Vol. 3, p. 494.10)

Commission Determination

The bulk of the testimony related to the ten-year solar forecasts in South Carolina was provided by DESC and Duke. As with any forecast, these forecasts necessarily make assumptions about a variety of unknown factors, including rate design and incentive landscape. Each utility

provided multiple scenarios under which certain of these unknowns were modified to ensure the Commission is provided with a range of potential outcomes in South Carolina over the next ten years. Each of these scenarios shows varying rates of growth for rooftop solar in South Carolina over the next ten years. Essentially, the common theme running through each utilities' forecast is that a clear appetite for rooftop solar exists in South Carolina regardless of a specific tariff design. This record reveals that the Commission can move confidently under Act 62's directives—which include addressing cost-shift and alignment of rates with cost to serve—in establishing the Solar Choice Program without fear of ending the rooftop solar industry in South Carolina. To the extent any infirmities exists in these forecasts related to C&I customers, the Commission takes comfort in C&I's relatively small contribution to the overall NEM customer base in South Carolina, and understands that any such infirmities would be *de minimis* when compares to the overall growth projected in South Carolina.

d. NEM Best-Practices

EVIDENCE AND CONCLUSIONS SUPPORTING FINDINGS OF FACT 7 - 8

The evidence in support of these findings of fact is found in the verified pleadings, testimony, and exhibits in this docket, and the entire record in this proceeding.

Pursuant to Act 62, the Commission may consider "any other information the [C]omission deems relevant" in this generic docket. Pursuant thereto, and via Commission Directive issued on August 26, 2020, the Commission required "utilities to provide to the Commission the best practices concerning net energy metering from other utilities and other states, particularly those in the Southeast."

Summary of the Evidence

Duke Witness Huber noted that the Commission's request to review NEM-related best-practices falls squarely within Act 62's mission of implementing this generic docket pursuant to which the Commission may be informed and utilize such information in "the Commission's subsequent consideration of the Solar Choice Program." (Tr. Vol. 2, p. 385.5) Mr. Huber explained that certain other jurisdictions have utilized best-practices to achieve similar goals as those contained within Act 62 related to Solar Choice—such as the elimination of cost-shift—and the consideration of those best-practices necessarily parallels the Commission's review of Existing NEM Programs. (Tr. Vol. 2, p. 385.9) Witness Huber reiterated the complexities of serving NEM customers that have been repeated throughout the record and in this order. (*Id*.) That is, NEM customers typically experience lower bills due to self-consumption, but the utilities do not experience a similar reduction in the cost to serve such customers. (*Id*.) Witness Huber explained that where rates do not accurately align with the cost to serve NEM customers, a cost-shift is borne by non-NEM customers because the utilities must account for the shortfall in recovery. (*Id*.) However, Mr. Huber pointed to other jurisdictions that have implemented tools aimed precisely at reducing this cost-shift by ensuring that rates adequately reflect the cost to serve NEM customers. (*Id*.) Witness Huber presented the Commission with a wide variety of tools that have been used in other jurisdictions to mitigate the inequities within the NEM rate structure. (*Id*.) These include TOU rates, demand charges, minimum bills, grid access fees, and non-bypassable charges. (*Id.*) Witness Huber cited jurisdictions such as Hawaii, Arizona, and Georgia—among others—that have implemented these rate structures. (Tr. Vol. 2, p. 385.9-385.13) Mr. Huber argues that these rates are precisely what Act 62 contemplated when mandating that customers should be offered a

rate structure that aligns "the customer's ability to achieve bill savings with long-term reductions in the overall cost the electrical utility will incur in providing service." (Tr. Vol. 2, p. 385.9) Although these rate structures represent innovative best-practices, Witness Huber provided the Commission with examples of tools (such as cutting-edge communications) that have already been utilized in South Carolina to ensure that customers are educated and able to respond to such rate structures. (Tr. Vol. 2, p. 385.13-385.14) However, Witness Huber cautioned that although certain best-practices or combinations thereof have proven to be "best-practices" in other states, whether these rate structures can have the same effect in South Carolina can only be determined in the context of an overall tariff. (Tr. Vol. 2, p. 385.14)

DESC Witness Everett provided a survey of NEM-related activity and best-practices in other jurisdictions as well. (Tr. Vol. 1, p. 125.35) Witness Everett noted a "great deal of activity around distributed generation . . . and NEM tariff reform." (Tr. Vol. 1, p. 125.36) Witness Everett's survey, in many ways, supports Duke Witness Huber's analysis of best-practices—that is, a clear focus by multiple other jurisdictions of implementing rate structures that more accurately align costs to serve than the simplistic rate structure of the Existing NEM Programs. (Tr. Vol. 1, p. 125.37)

On rebuttal, Witness Barnes takes issue with DESC's characterization of Witness Everett's survey as "comprehensive" given that it only covers twenty states. (Tr. Vol. 2, p. 331.16) However, Witness Barnes agreed with Ms. Everett's assessment that there is diversity and a range of approaches in how states have established DER rates and policies, including NEM policies. (*Id*.) Although Witness Barnes alleges several factual inaccuracies and overstatements in Ms. Everett's survey, Witness Barnes acknowledges that "the existence of a possible cost-shift is a fairly

prominent point of interest" among states that are refining DER compensation regimes. (Tr. Vol. 2, p. 331.17) Echoing testimony provided by Witness Huber, Witness Barnes cautions that each scenario contains "nuances" that should be examined on a case-by-case basis. (*Id.*)

Finally, Witness Huber expressed that, upon review of the direct testimony, there are certain common recommendations as to what may be considered best-practices in South Carolina. (Tr. Vol. 2, p. 387.5) Witness Huber notes agreement among himself, Witness Lawyer, Witness Horii, Witness Beach, and Witness Everett on utilization of TOU rates as well as a minimum bill—evidencing "a consistent message from parties on all sides that any successor tariff should implement more complex rate design tools, consistent with Act 62." (Tr. Vol. 2, p. 387.9) As such, Witness Huber opines that this analysis of best-practices can be utilized by the Commission when considering the Solar Choice Program in subsequent dockets by: (i) evaluating more complex rate designs to eliminate cost-shift "to the greatest extent practicable," (ii) contemplating new mechanisms to "recover utility fixed costs, independent of customer usage, and charges to recover a customer's maximum use of the grid," and (iii) leverage the analyses performed in this docket to evaluate a "broad range of rate structures." (Tr. Vol. 2, p. 387.10-387.11)

Commission Determination

The record reveals that the cost-shift phenomenon under NEM programs is not specific to the State of South Carolina, and a number of jurisdictions have utilized a variety of innovative rate structures to mitigate this cost-shift. These innovative rate structures include time-variant rates—which are specifically contemplated by Act 62—as well as demand charges, minimum bills, and non-bypassable charges. When compared to the simplistic rate structure under the Existing NEM Programs, it is clear that these innovative rate structures more accurately align rates with the actual

cost to serve those NEM customers. By more accurately capturing the cost to serve NEM customers in accordance with Act 62, these innovative rate structures may be able to alleviate the cost-shift under NEM programs because utilities would recover a greater portion of costs to serve from those customers rather than recovering the same costs from non-NEM customers. Indeed, there is agreement among several of the Parties that TOU rates, in conjunction with a minimum bill, may be appropriate in South Carolina. It is clear that the vast majority of jurisdictions across the country have moved away from simplistic rate structures to more innovative rate structures in the NEM context. However, any such rate structure must be evaluated in the context of a specific tariff to determine whether such structures are appropriate for South Carolina. While these rate structures are necessarily more complex, a review of the record indicates that customers are generally responsive to these rate structures, including the price signals arising therefrom.

Although the purpose of this generic docket is to simply inform the Commission as to NEM-related best-practices in other jurisdictions rather than implement such practices in Existing NEM Programs, the Commission finds that Act 62 implements different goals for the Solar Choice Program than Existing NEM Programs, and it is very likely that these innovative rate structures may help achieve those goals. Therefore, while these best practices will not be utilized for the current NEM Programs, it is reasonable and appropriate to leverage the best-practices presented in this docket when the Commission considers the utilities' Solar Choice Tariffs and consider a broad range of options to ensure that any such best-practices are fulfill Act 62 and are appropriate for not only South Carolina, but also the specific tariff into which they are incorporated.

VII. ORDERING PARAGRAPHS

NOW, THEREFORE, IT IS HEREBY ORDERED THAT:

1. The pre-filed testimony of Duke witnesses George V. Brown, Bradley Harris, Lon Huber, Leigh C. Ford, and Dr. Julius A. Wright; the pre-filed testimony of DESC witnesses Scott Robinson, Margot Everett, and Mark C. Furtick; the pre-filed testimony of SACE/CCL/UF/Vote Solar/SEIA/NCSEA witness R. Thomas Beach; the pre-filed testimony of SACE/CCL/UF/Vote Solar witness Frank Hefner; the pre-filed testimony of SEIA/NCSEA witness Justin R. Barnes; the pre-filed testimony of Vote Solar witness Odette Mucha; the pre-filed testimony of Alder Energy witness Don Zimmerman; and the pre-filed testimony of ORS witnesses Robert A. Lawyer, Brian Horii, and John C. Ruoff, along with their respective exhibits entered into evidence as Hearing Exhibits 1 through 15, are accepted into the record in the above-captioned case without objection. Further, the oral testimony of the above witnesses presented at the hearing on November 17, 2020, November 18, 2020, and November 19, 2020, is also incorporated into the record of this case.

2. Based upon the testimony and exhibits received into evidence at the hearing and the entire record of this proceeding, the Commission hereby adopts each and every finding of fact enumerated herein. The Commission's conclusions of law are fully stated above.

3. Any motions not expressly ruled upon herein are denied.

4. Customer-generators impact a utility's long-run marginal costs in a manner similar to (i) customers enrolling in EE/DSM programs with regard to self-consumption and (ii) PURPA QFs with regard to production deemed exported. The Commission finds that viewing customer-generators through this lens is not only accurate, but has the benefit of utilizing well-established, Commission-approved frameworks.

5. Act 62's requirement to evaluate cost of service implications necessarily requires an examination of marginal and embedded costs. The Commission finds it reasonable and appropriate to utilize Commission-approved allocators from the most recent rate cases when examining embedded costs given that those historical costs were allocated pursuant thereto and this allocator is used for rates currently in effect.

6. A review of these studies indicates that an un-warranted cost-shift arises under Existing NEM Programs which is borne by non-NEM customers, which necessarily means that customer-generators would not provide adequate return to the utilities if they were a separate class under Existing NEM Programs.

7. The currently-effective values utilized in the Act 236 Methodology are appropriate to continue under the Existing NEM Programs.

8. The Commission is unable to adequately assess the direct and indirect economic impacts of the Existing NEM Programs given the difficulty in evaluating these impacts. Going forward, any such analysis of these impacts in an NEM context must comply with the two-step process outlined by the Commission in this Order.

9. The Act 236 Methodology is appropriate and will continue unchanged for Existing NEM Programs until such time as the Commission deems it reasonable to update the methodology, if at all.

10. Jurisdictions across the country are increasingly turning away from simplistic rates in favor of innovative rate structures to address the complexities of serving NEM customers. These innovative rate structures have apparently been effective in reducing un-warranted cost-shift by aligning rates with the cost to serve these customers.

11. Regardless of the specific tariff structure, it is clear that rooftop solar will continue to expand in South Carolina for at least the next ten years.

12. Although this docket was established to examine Existing NEM Programs, the Commission will soon consider Duke and DESC's respective Solar Choice Tariffs under Act 62. It is clear that such evaluation will consider different goals than those outlined within Act 236. The Commission will leverage the broad range of information and analyses obtained in this generic docket to ensure that the spirit of Act 62 is fulfilled when establishing the new Solar Choice Tariffs. Among other things, the Commission will leverage the long-run marginal cost analyses, cost of service studies, and best-practices from other jurisdictions to achieve the goals within Act 62.

13. This Order shall remain in full force and effect until further Order of the Commission.

BY ORDER OF THE COMMISSION:

_____
Justin T. Williams, Chairman

ATTEST:

_____
Jocelyn Boyd, Chief Clerk/Administrator